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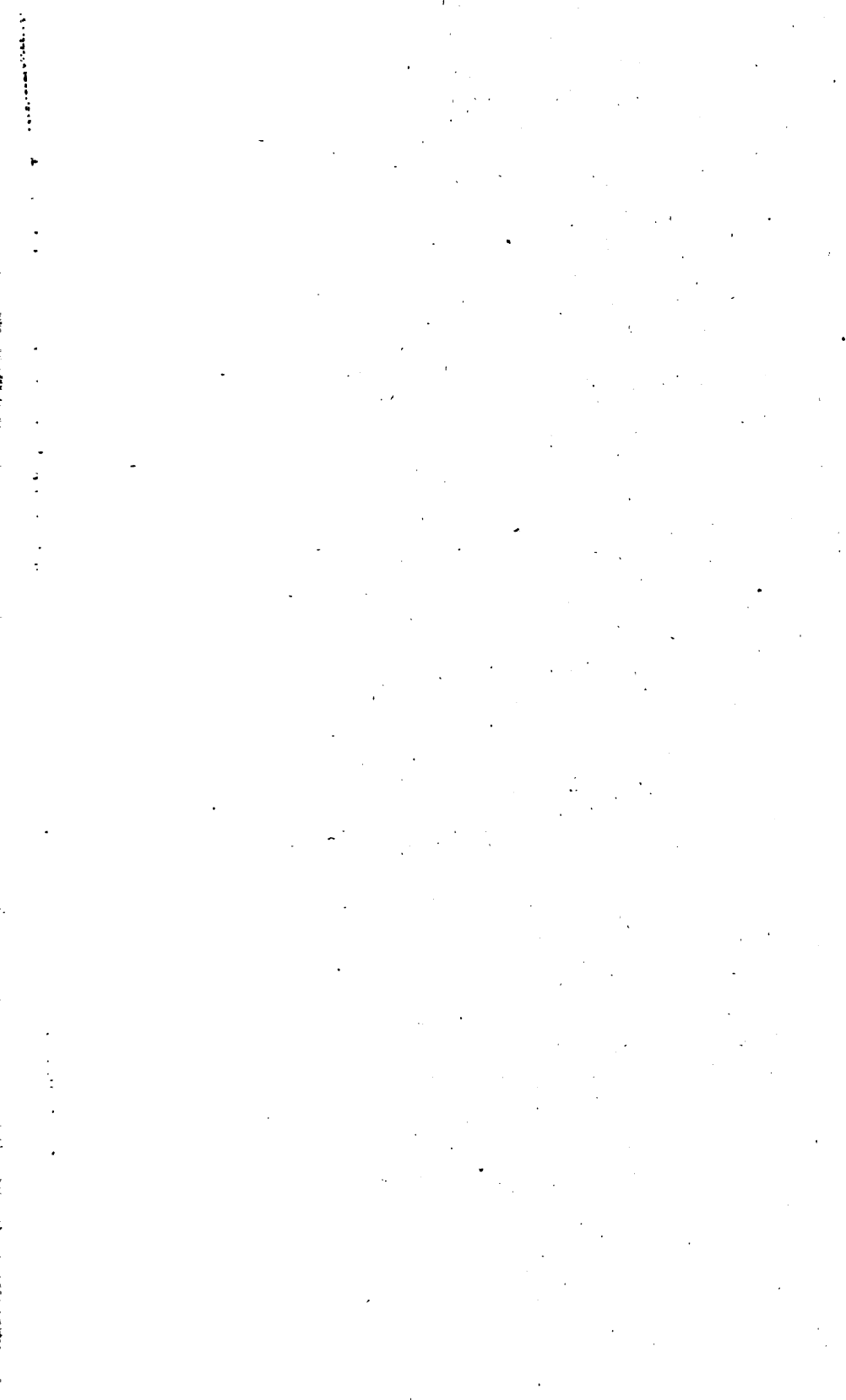
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A QUARTERLY REVIEW OF

DISEASES OF THE NERVOUS SYSTEM, MEDICAL
JURISPRUDENCE AND ANTHROPOLOGY.

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ORIGINAL COMMUNICATIONS.

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ART. I.—*The Psychical Status and Criminal Responsibility of the Totally Uneducated Deaf and Dumb.* By ISAAC LEWIS PEET, A. M., Principal of the New York Institution for the Instruction of the Deaf and Dumb.¹

Nec ratione docere ulla suadereque surdis
Quid sit opus facto, facile est; neque enim paterentur
Nec ratione ulla sibi ferrent amplius auris
Vocis inauditos sonitus obtundere frustra.

LUCRETIVS, *De Rerum Natura*, Book V., 1052-5.

THE deaf-mute, as distinguished from one who is simply mute, is a person who, from the mere fact of want of hearing, does not possess the ability to express thought in articulate speech. Dwelling in a world of silence, sound awakens no responsive echo in his soul. Words which, thrilling nerves that excite the brain to action, call for an effort at least of imitation on the part of the child endowed with hearing,

¹ Read before the Medico-Legal Society of New York, November 9, 1871.

affect in him no sense that may be said to produce their counterpart. As the eye is wanting to the denizens of those subterranean localities into which light does not penetrate; as limbs are not furnished to beings whose locomotion is confined to a liquid *habitat*; and as the hand is denied to those orders of the animal creation to whose functions that marvellous instrument is not indispensable, so, where there has been no hearing, there is no natural voluntary exercise of the corresponding faculty of speech. This does not imply, what is indeed in most cases contrary to the fact, that the physical organs of speech are defective, for, if the deaf-mute could be invested with hearing, speech would soon follow, and many that have never heard, have been so educated in the use of these organs as to be able to pronounce syllables and words in a manner recognizable by the ear. The mute who is not deaf, however, owes his infirmity to one of two causes: either there is malformation or weakness in some one of the parts on which vocal utterance depends, or there exists a want of vigor in one or more of the intellectual powers, even supposing such powers not to be entirely wanting. Of those mute from the first-mentioned cause, *two* have been brought directly under my own personal observation and instruction. One was a boy twelve years of age, who had been accustomed to hear, and hear perfectly, the conversation of those around him, and who could answer a great variety of questions which could be satisfied by an affirmative or negative movement of the head, and could obey directions given to him with the voice, but had never himself uttered a word. The malformation of his organs of speech was patent to the slightest inspection. He could not, when he entered the institution, read or write, but, after several years of patient instruction, was brought to a point where he could derive information from books, and express his thoughts and feelings with the pen. Without a natural defect of verbal memory, it was yet evident that this faculty had been greatly impaired by want of the ability to give expression to the words he knew; for it was a long time after he had learned to write single words from vocal dictation before he could retain a sentence of even moderate length so as to reproduce it. His other faculties

were very much quickened by the use, on his own part, of signs, which he readily learned. Of course it was necessary to explain to him every form of expression he had not heard before. This was done partly by means of spoken words and partly by gestures, which he seemed to comprehend the more readily from the fact that, in the society of deaf-mutes in which he was necessarily placed, he acquired a great facility in expressing himself in that way. In his case, the power seemed to be developed of comprehending more perfectly what was communicated by the method to which he himself naturally had recourse when communicating his ideas to others.

The other case was that of a young man eighteen years of age, also mute from birth. He entered the institution entirely illiterate, never having learned the alphabet in either its printed or written form. He had great self-respect, always attired himself neatly, and appeared to advantage in the silent intercourse he had with others. He had for some years worked in a woollen factory, and was able to support himself without assistance from his friends. In the single year he was under instruction, he acquired an ability to read understandingly, as well as to give correctly in writing the incidents of every-day life, so that on returning to his manual labors he was in possession of a very satisfactory means of communication with others. Unlike the lad first mentioned, he must all the while have had a mental speech fully up to the necessities of the society in which he was accustomed to move. The language of signs was not used in his instruction, and he seemed to feel no inclination to avail himself of it. No impediment of speech was apparent to the eye—his inability being probably the result of some imperfection in the larynx.

The writer's own experience of nearly thirty years, however, enables him to add his testimony to that of other instructors of the deaf and dumb, to the effect that cases of hearing-mutes, with good intellectual capacities like those just mentioned, are so rare as to make the possession of hearing in connection with want of speech *prima-facie* evidence of mental imbecility. Instances of this last kind are unfor-

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unately very numerous. Hardly a year passes that several such mutes are not presented for admission into institutions for the deaf and dumb by parents, whom hope had directed thither, to find that the calamity which had befallen their children was one far more deplorable than that of mere inability to enunciate words, as it also is of mere inability to hear them, notwithstanding all that this last-named condition involves. The active part which those connected with institutions for the deaf and dumb have taken in the initiation of idiot asylums, and the frequent occasion they have for correspondence with their managers, is thus accounted for. With beings such as these, patient effort to call into exercise a dormant will, and gradually to develop enfeebled faculties, has met with some degree of success, and, if I am correctly informed, some have been enabled to attain intelligent vocal utterance. But the greater proportion are incapable of appreciable benefit, so that our idiot asylums, so far as they prove themselves schools, must be regarded in the light of institutions wherein only those children can be benefited who are not so far demented as to be incapable of speech.

No such proposition can be entertained with regard to the deaf-mute. His defects are not primary, as appertaining to the mind; but secondary, as the resultants of the deprivation of one of the senses. The only class of ideas to the perception of which he may not arrive are those which are dependent in themselves, considered upon the sense of hearing, though the vibrations which affect other nerves than the auditory may produce sensations so analogous that he may be considered, so to speak, as under the influence of the penumbra rather than that of the total eclipse, or perhaps more appropriately under the faint refraction called twilight instead of the full light of day. For instance, the *drum* will at once attract the attention of any deaf-mute, however profound his deafness, and the idea of musical *time* is appreciable by the majority of this class. Experiment has shown that the telegraph alphabet of Morse, beaten on the drum, on the principle of a single strong-beat for the short dash, and a quick double-beat for the long one, gives rise to vibrations affecting the deaf so distinctly, that a class of such per-

sons, with their faces so turned that they could not catch sight of the instrument, have recognized words spelled by this means, and written them promptly and accurately upon the black-board; and, in at least two instances, deaf-mute young ladies, without a particle of hearing, have been taught to render correctly, on the piano, strains of music represented to the eye by notes.

It will thus be seen that, like the Parian marble in which the mind of a Praxiteles sees the perfect statue, and from which, with cunning hand, he develops the realization of his ideal, or the rude mass of iron in which the master-artisan perceives, and from which he evokes the moving, almost breathing machine, the uneducated deaf-mute is a being of great possibilities, but still only possibilities.

His condition is a field on which Psychology gazes with interest as intense as that with which Newton viewed the starry firmament, and in which he seeks the solution of questions more difficult than those which the geologist asks the rocks.

Are there innate ideas? Is thought possible without words? Is the idea of God inseparable from the human mind? Is conscience an innate or an acquired faculty? Is moral responsibility a principle applicable to those who, possessing mental and moral powers, are yet so restrained in their exercise that they are but very imperfectly developed? Such are a few of the inquiries which spontaneously suggest themselves in connection with this subject, and which will necessarily be touched upon, if not fully discussed, as we attempt its development.

The term *uneducated*, as applied to a deaf-mute, is not to be understood as implying merely the absence of training in verbal language, but of all successful attempts on the part of those around him to make available to him the observation and experience of others, and to fix in his mind general principles of thought and action.

Considered in this light, what is he? Is he an intellectual being, and, if so, in what sense? Though the current thought of the community in which he dwells finds no access to his mind, though the language which conveys to the hearing

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child of three or four years of age the germs of all subsequent knowledge is unheard and unheeded, he possesses a certain degree of mental power which is entirely independent of such conditions.

This is not confined to that recognition of forms, and that association of recognized objects with qualities, and of actions with resulting sensations, in which many of the brute creation show such a degree of intellectual power as to make it difficult to fix the boundary between what we call instinct and reason; for, though many of the mental phenomena presented by deaf-mutes are merely a higher development of what is usually regarded in the light of animal instinct, as exemplified by the chicken that runs to covert when the wing of the hawk sweeps the sky, by the bee that flies in the face of the nearest stranger when the hive is disturbed, or by the dog that runs in the direction indicated by the finger of his master, still the higher possibilities of the heir of human reason soon manifest themselves.

Perhaps the first evident token of a reason higher than that of the highest of the mere animal creation, is the ability to designate specifically the object of desire, when that object is not in sight, and to complain specifically of wrong done when the author of that wrong is not present. Many of the inferior animals can manifest their desire for some object which they can designate when it is present, and some can exhibit indignation against those who have wronged themselves or their masters when they see the wrong-doer before them, but it is an exclusively human prerogative to be able to designate the *absent* intelligibly to others, and a yet higher prerogative to be able to designate the kind of wrong or the kind of benefit received at a time past. The dog who barks furiously at the man who struck him yesterday was never known to *indicate* purposely whether he was struck with a stick or a stone, whether in the head or the foot.

We may assume, then, that the starting-point of human intellect, as distinguished from animal instinct, is the use of *signs* to designate absent persons, objects, places, qualities, and actions. For the child who hears, these signs are very early supplied by the spoken words constantly ringing in his ears. For the deaf-mute, they must be visible signs.

When, therefore, a deaf-mute child has become able to designate whether he wants this thing or that, neither being in sight, or to tell what was taken from him and who took it, he has evidently ascended above the domain of mere animal instinct. The intelligent use of signs for ideas, furnished by gesture and expression, is as much a test of the possession of human reason as the intelligent use of the verbal signs which we call speech.

There are deaf-mutes whose sign-dialect is very rude and meagre, and there are deaf-mutes equally ignorant of verbal language who yet possess quite an extensive and well-developed system of signs. The difference is only in degree.

As, in the scanty dialect of a tribe of savages, we recognize the human power of speech, so in a very moderate ability to use signs on recalling the absent and the past, we recognize those germs of human intellect, which may develop into the multiform bloom of a cultivated language of gesture and expression.

That man is proved to be man only by the possession of a language, is a received axiom. That this language or means of communication may be addressed to other senses than the ear, all intelligent men will admit. But the corollary that this language, the possession of which stamps its possessor as a rational being, may be simply a language of gesture, movement, and expression, without any hint of words spoken or written, is apprehended with difficulty by many men even of high intellectual cultivation. And yet this is equally demonstrable by facts and analogies.

It is very true that the processes of mental development, by speech and by a language of gestures, are not parallel—cannot, in fact, be made to run parallel. The great prerogative of the *one* is its power of generalizing and concentrating thought. The *other* owes to the pantomime which forms its basis, supplies its elements, and gives it much of its self-interpreting power, a certain pictorial character. Hence it is more graphic, and, for the class of material ideas, more precise. But, naturally dealing with the concrete and the actual, it grasps generalizations, abstractions, hypotheses, and personifications with difficulty, and attains to their full expression only after

long and diligent cultivation, under the auspices of minds trained by the aid of verbal language. The great difference apparent in the mental and moral condition of uneducated deaf-mutes who were probably originally of equal mental capacity, is due to the fact that the ignorance, stiffness, and prejudices, of many of the connections and natural guardians of deaf-mute children have operated to induce them to repel, rather than encourage and aid, the instinctive efforts of the deaf-mute to make his wants and wishes known by signs. Hence it is that a deaf-mute child placed in such discouraging circumstances begins to talk by signs much later, and develops much less ability to communicate in that way than another deaf-mute child who is surrounded by intelligent and sympathizing friends, especially where there is already, in the family, some knowledge of the mode of communicating with the deaf by gestures and pantomime. Thus it is that, where there are two or more deaf-mutes in the same family or neighborhood, they usually possess a much more expanded dialect of signs than that which a solitary mute may be able to devise, and, as will be easily inferred, their social enjoyments are much greater, and their intelligence, being so much earlier and more constantly called into play, is much more fully developed.

In cases of extreme neglect, the deaf-mute may seem hardly superior to an idiot. But the capacity for development still remains, often to a somewhat late period of life, though, of course, faculties left so long in total inaction become more and more torpid with advancing years.

Cases of such extreme neglect are not now very common. The magnetic sympathy of mind with kindred mind penetrates the barriers interposed by closing the usual channels of sense, and it is seldom, indeed, that the deaf-mute is not blessed with at least one or two companions who, finding the ear-gate closed, will aid him to make more straight and easy the path to communion of souls through one or more unaccustomed portals.

A few years since, there died in Scotland a very old man bearing the name of James Mitchell, a name he himself had never learned to utter, or write, or spell. He had never heard

the *voice*—never looked on the *face* of man or woman. Yet, though deaf and blind from birth, he gave evident proofs of the possession of human faculties, and by means of signs could make his wants known with considerable particularity to the one or two accustomed to communicate with him, and could receive and follow out directions addressed to the sense of touch to an extent which may seem incredible to those who have not investigated the ability of the human soul to supply senses that are wanting, by the cultivation of those that remain. Had he been so fortunate as to meet a Howe or Hirzel in his plastic youth, he might have attained to a mental and moral cultivation perhaps not inferior to those which have rendered Laura Bridgman and James Edward Meystic the marvels of the world.

You will probably recollect that Blackstone, that oracle of the English common law, while admitting that ordinary deaf-mutes may manifest their wishes by signs, holds that one deaf, dumb, and blind from birth, must necessarily be in the condition of an idiot. But those who have investigated such cases as that of James Mitchell are aware that the germs of a sign-language possessed by him are capable of being developed, as was done in the case of Julia Brace at Hartford, so as to furnish a medium for all necessary communications. Even with the deaf, dumb, and blind, where there are human faculties, the difficulties that prevent their development and cultivation may leave the individual low down in the scale of intelligence, but still far above the idiot or the mere animal.

It is painful to recall the judgments that in former times have been passed on the uneducated deaf-mute. There are few but have heard of that man of saintly and self-sacrificing benevolence, the Abbé de l'Épée, who devoted his life and his fortune to the melioration of the lot of the deaf and dumb, and to whose zeal and labors it is in large measure due that education became possible to more than a favored few of that afflicted class. This good man was accustomed to speak of the uneducated deaf and dumb as being on a level with the beasts that perish. His world-renowned disciple and successor, Abbé Sicard, declares that "a deaf person is a perfect cipher, a living automaton. He possesses not even that sure

instinct by which the animal creation is guided. He is alone in Nature, with no possible exercise of his intellectual faculties, which remain without action. As to morals, he does not even suspect their existence. The moral world has no being for him, and virtues and vices are without reality."

Other eminent teachers have put forth opinions equally derogatory. M. Guyot, of Groningen, one of the names that shine the brightest among the early benefactors of the deaf and dumb, assures us that "this unfortunate class are by Nature cut off from the exercise of reason; they are, in every respect, like infants, and, if left to themselves, will be so always, only that they possess greater strength, and their passions, unrestrained by rule or law, are more violent, assimilating them rather to beasts than men."

An eminent German teacher, Herr Eschke, of Berlin, says: "The deaf and dumb live only for themselves. They acknowledge no social bond; they have no notion of virtue. Whatever they may do, we can impute their conduct to them, neither for good nor for evil."

Another German teacher, Herr Caesar, of the school at Leipsic, founded by the celebrated Heinicke, the father of the German method of instruction, remarks that "the deaf and dumb, indeed, possess the human form, but this is almost all which they have in common with other men. The perpetual sport of impressions made upon them by external things, and of the passions which spring up in their own souls, they comprehend neither law nor duty, neither justice nor injustice, neither good nor evil; virtue and vice are to them as if they were not."

Dr. Barnard, to whom I am indebted for these citations, very justly and pertinently remarks that many of these instructors brought to their task the prejudices once universal, and not yet extinct, which classed deaf-mutes among idiots. They seem, moreover, to have been unconsciously influenced by a desire to exaggerate the sad condition of the uneducated mute, so as to make a stronger appeal to public sympathy, and to set in a brighter light the success of their own labors by contrast with the dark condition of the being whose education they had undertaken.

There are not wanting testimonies on the other side of the question. I will here only cite that of M. Bébien, a younger associate of Sicard, in the institution at Paris, and the most able and accomplished teacher of deaf-mutes in his time. His opinion is thus expressed: "Deaf and dumb persons only differ from other men by the privation of a single sense. They judge, they reason, they reflect. And, if education exhibits them to us in the full exercise of intelligence, it is because the instructor has received them at the hand of Nature, endowed with all the intellectual faculties."

To reconcile these conflicting opinions of eminent authorities, we must recall the fact already stated, that there is an immense difference, both mental and moral, between a deaf-mute who has been neglected, and possibly hidden away from society as a family disgrace (a treatment not unusual in the times before the zeal and success of De l'Epée made deaf-mutes objects of curiosity, attention, and wonder), and a deaf-mute who has been blessed with kind companions and has been encouraged and aided to enlarge and improve his pantomimic dialect. In a deaf-mute in the *former* condition, even the germs of the rational and moral faculties are scarcely manifested. In the latter, they have acquired a very considerable but somewhat peculiar development.

In treating of the psychological condition of the uneducated deaf-mute, we will take one of the average condition of the class—neither a victim of total neglect in childhood, nor the favored recipient of unusually kind, constant, and intelligent care. And here we must distinguish between what he is intellectually and what he is morally. By the effort to communicate his most obvious wants, and to bring himself into association with others, and by the reciprocal effect of attention to these wants, and of response to his overtures, his mind is quickened into activity. The signs that spring up in his intercourse with his family may refer to all the more obvious interests of their mutual every-day life. He may be told to bring water from the spring, to call his father or brother, even to go to the store for certain articles. He may be told that the family will go to church after sleeping once, and that he will accompany them, or that he may ride to a

neighbor's, or that a friend is coming to see him, and he will understand it all; but the moment that there is an attempt to communicate any thing that has not been shown him, or that he has not seen, the effort fails. He obtains, if not a confused, at least a very erroneous idea. He is, therefore, left very much to his own conceptions. That he has an idea of cause and effect, there is no doubt, from the recorded recollections of deaf-mutes concerning their days of ignorance. This idea is concrete in the sense that he seldom arrives at general conclusions, his judgment being exercised on particular cases that have fallen under his observation, and which he recognizes when they occur again. He knows that when it is cold he can obtain warmth by putting wood in the stove and lighting it; that if he leaves a pitcher of water out-of-doors on a cold night, it will freeze, and the pitcher will break; that if he goes out in the rain he will be wet; that if he falls he will be hurt. By observing an effect familiar to him, he also knows what has produced it. He recalls past scenes which have been a part of his experience, and he anticipates what will happen on the morrow when a particular pleasure is promised him. He has, therefore, the power of memory, of analogy, and of imagination. He has, moreover, the association of ideas; for, in his efforts to communicate, it is observed that one thing will suggest another, and, in his silent communings with himself, he will have a succession of thoughts, one arising from another. In all this exercise of mind, except when he is actually conversing with others, he does not employ any vehicle of thought, not even signs. This is the invariable testimony of all deaf-mutes whom I have questioned on this subject. *They think in images, and the signs they make grow out of and represent these images.*

Nor is this method of thought peculiar to deaf-mutes. The dreams which visit us in the hours of sleep are nothing more. The visions of inspired seers required careful subsequent effort to portray them in words. The poet reproduces, in the music of rhythm, the same ideal scenes that the painter presents to us on the canvas, and the converse is true that the painter is often the poet's best interpreter. It is thoughts without words that have immortalized Handel and Mozart

and Beethoven, and given to their stirring symphonies a power that eloquence often strives for in vain. The blast of the bugle is a more inspiring call than the captain's "Forward!" and the light streaming on the banner a more cheering encouragement than any shouted words of hope. The journalist gives us descriptions of scenes and incidents which he has viewed, and succeeds in conveying to us correct conceptions, only by attaining that precision in the use of words which will enable the reader to form a distinct picture in his mind. The historian must carry his imagination back to the past, and, so to speak, lose himself in it, to convey to our minds any just conception of what *was*. It is this principle which gives such popularity to illustrated periodicals, and which makes the actor an educator to a certain class of minds. The etymological signification of the word *idea*—what is beheld—is of itself an indication that at least a large class of our thoughts are but pictures in the mind.

The expression, then, that we think in words, means nothing more than that long practice has enabled us to associate some form of words directly with our thoughts; for the thought is always antecedent to the expression.

In generalization, it is true, words greatly assist in keeping before us a certain pivotal idea, but even this idea is but a synthesis of many concretes instantaneously made in the subtle alchemy of the mind. No true thinker gives words the prominence in his mental laboratory, both as writer and student. He painfully endeavors to represent, by approximating symbols, thoughts to which he feels he can never give the exact expression, and he carefully analyzes, with patient toil, the words which others have presented as *their* embodiment of truth.

Educated deaf-mutes have furnished to us, by their recollections of the past, much that throws light upon the amount of knowledge they had acquired previous to the time when they were brought under systematic instruction.

The details and results of a searching inquiry into this subject are given in a paper on the "Notions of the Deaf and Dumb, especially on Religious Subjects," contributed by my venerable father Dr. H. P. Peet to the *Bibliotheca Sacra* of

July, 1855. To renew the investigation, for the sake of originality, even if I might hope to bring it to as complete and satisfactory an issue, would be a work of supererogation. I, therefore, avail myself of Dr. Peet's labors, so far as they illustrate my present theme.

"Few, if any, of these unfortunate children," says Dr. Peet, "seem ever to have reflected on the origin of the universe or the necessity of a first cause for the phenomena of Nature. As one of them expresses it, they 'thought it was natural' that the world should be as it is. Some even fancied that those whom they saw to be old had ever been so, and that they themselves would ever remain children" (or at least had not learned to anticipate a time of old age for themselves). "Those who had learned, by observation and testimony, the general law of progress from infancy to old age, supposed, if they attempted to think on the subject at all, that there had been an endless series of generations. But probably there are very few uninstructed deaf-mute children of ten or twelve who have reached such a point of intellectual development as even this idea implies. It is much easier to give to a deaf-mute, by means of rude and imperfect signs, the idea that there is some powerful being in the sky, than to explain or even hint that this being made the world. Hence it is that very few deaf-mutes have ever acquired, either from their own reflections or from the imperfect signs of their friends, any idea of the creation of the world, or even of the plants and animals on its surface. Nor need this surprise us, when we reflect that the most enlightened nations of antiquity had not mastered this great idea. Ovid, writing in the learned and polished era of Augustus, expressed the popular belief of his time in the theory that all things were produced by the due union of heat and moisture.'

"Many deaf-mutes, however, whether from their own meditations, or from misunderstanding the signs of their friends, have acquired childlike ideas respecting the causes of certain natural phenomena; such as rain, thunder, and

¹ "Quippe ubi temperiem summere humorque calorque
Concipiunt; et ab his orientur cuncta duobus."

Metamorphoses, I., 8.

the motions of the heavenly bodies. Quite a number supposed that there were men in the sky who, at certain times, made themselves busy in pouring down water and firing guns. The notions of deaf-mutes on such matters are often amusing enough ; but, when not derived from a misconception of the signs of their friends, are evidently formed in a spirit of analogy. . . . An English deaf-mute boy, observing that he could raise quite a strong wind with his mother's bellows, naturally concluded that the wind that sometimes blew off his cap in the street came from the mouth of a gigantic bellows. Neither does it seem that this belief was troubled by his inability to find the operator or the location of this bellows, for to one whose sphere of observation was so limited, and who could learn so little of the world beyond it from the testimony of others, the region beyond the circle of a few miles was as wholly unknown, and as open to the occupation of imaginary giants and engines and other figments of the imagination, as was ever the land of the Cimmerians to the Greeks, or the Fairy Land to the popular belief of the middle ages. Similar to this was the notion of a girl, who seems to have imagined that the plants which spring up annually in the fields and woods were like those in her mother's garden, planted and watered by 'some women,' an infantile conception, in which, however, may be traced the first germ of the old Greek notions respecting nymphs and dryads. . . .

"One lad, struck by the similarity between flour falling in a mill and snow falling from the clouds, concluded that snow was ground out of a mill in the sky. Others supposed that the men, with whom their imaginations, or the misconceptions of the signs of their friends, had peopled the sky, brought up water from the rivers or ponds and dashed it about through holes in the heavenly vault. The more general belief seems, however, to have been that there was a great store of rain and snow in the sky, a matter no more to be wondered at than the abundance of earth and water below. Some suppose thunder and lightning to be the discharge of guns or cannon in the sky ; a notion the converse of that well-known one of the savages, who, when they first

met in battle a European armed with a musket, believed they had encountered a god armed with thunder and lightning. Others say they believed lightning to be struck from the sky by iron bars. They had doubtless observed the sparks struck by iron from stone."

Thus it is that human nature repeats its phenomena, and that deaf-mute children, left, by their inability to profit by the experience of their elders, in a prolonged infancy, exemplify, in their efforts to account for the phenomena of Nature, many of the fancies that prevailed in the infancy of society. The last idea cited bears a curious resemblance to the Homeric conception of Jupiter hurling the thunder-bolts forged by Vulcan.

In answer to the question whether they had any idea how the sun, moon, and stars, were upheld in the sky, the uniform reply was that they had never thought about it. "It seems as natural to children that those bodies should keep their places above us as that the clouds or the sky itself should. . . . The stars in the view of many were candles or lamps lighted every evening for their own convenience by the inhabitants of the sky, a notion very natural to those who had had opportunities of watching the regular lighting at night of the street lamps of a city. The moon was, to most of those whose answers are before us, an object of greater interest than any of the other heavenly bodies. One imaginative girl fancied that she recognized in the moon the pale but kind face of a deceased friend; others thought that she continually followed them and watched their actions." A few regarded the moon with fear, while others thought she loved them.

The answers to the question, "Had you any idea of the existence of the soul as something distinct from the body, and which might be separated from it?" were uniformly in the negative.

"It is remarkable," says Dr. Peet, "that only one, out of more than forty whose statements are before us, seems to have imbibed any of the popular superstitions respecting ghosts. If the misfortune of the deaf and dumb prevents them from learning much truth, it often protects them in most cases from receiving those early impressions of superstitious terror and folly which it is often so difficult to get rid of in later life."

To the question "What were your thoughts and feelings on the subject of death? Did you know that you must yourselves die?" Dr. Peet cites many interesting answers, which my limits compel me to omit. Their uniform tenor was to show that to the uneducated deaf-mute death is truly the king of terrors. Those who had not been taught the contrary by the signs of their friends, cherished the belief that they could evade its power and live on forever. "We have heard of a lad," he says, "who, having observed that people who died had taken medicine, resolved to abstain from medicine as well as other hurtful things, an example of prudence worthy of general imitation." Another had entertained the horrible suspicion that the doctor's business was to poison off the sick; reminding us that tribes of savages have sometimes risen in fury and murdered missionaries, because the sick to whom they had given medicine had died.

"So far as we can learn from their statements," says Dr. Peet, "none of the deaf and dumb have originated the idea of the existence of the soul after death, in a state separate from the body, and the attempts (unskillfully) made for this end, by many anxious parents, have at most given the child-like idea that the dead are taken bodily from their graves, or thrown bodily into a fire. The early impressions of certain German deaf-mutes, recorded by one of their number (O. F. Kruse, of Schleswig), were, that the bodies of the good remain uncorrupted in the grave, where they only slumber to be hereafter awakened, while those of the wicked rot and become the prey of worms. It is easy to understand that children who have never seen a corpse, except in the brief interval between death and burial, may suppose that the dead only sleep in the grave. One of the pupils in the New York institution had been haunted by the terrible idea that, should she die and be buried, she might awake in the grave, and would be unable to call for help."

The general testimony of the deaf and dumb is, that before instruction they never had any idea whatever of the object of public or private worship, some probably taking the weekly assemblage at church as being as much a matter of course as any other periodical event; while others, if they tried to think

about it, only added it to the long list of human actions which, in their darkened state, were incomprehensible to them. One or two seem to have made a shrewd guess at the secret motives of some outward professors, when they considered public worship as a recreation, and family prayer as a play; and the idea of another, that people met to do honor to the clergyman, might in some cases be pretty near the fact.

"To the same purport," says Dr. Peet, in summing up, "on all the points we have considered, is the testimony of many other deaf-mutes both in Europe and America. Nor have we ever learned of any well-authenticated case of a deaf-mute who gained any correct ideas on religious subjects, by his own unaided powers of observation and reflection. We feel authorized, by the evidence before us, to deny that any deaf-mute has given evidence of having any innate or self-originating ideas of a supreme being, to whom love and obedience are due, of a Creator, or of a Superintending Providence, of spiritual existence, or of a future state of rewards and punishments." And this is the testimony of all who know the deaf and dumb thoroughly.

Yet the readiness with which deaf-mutes, at an early stage of their instruction, apprehend these great truths, the unquestioning faith with which they receive them, and the eagerness with which they cling to the hope of immortality, and especially to the promise that in heaven the deaf shall hear and the dumb join in the everlasting song of praise, conclusively show that the Creator has implanted in these children of silence a capacity for religious sentiment as fully as in their brothers and sisters who hear. And though St. Paul says, "Faith comes by hearing," he only meant to those who *can* hear. Had he ever known an educated deaf-mute, a spectacle which the world never saw till centuries after the great apostle had finished his course, he would have admitted that faith might come in the fullest measure through signs alone.

In a moral point of view the uneducated deaf-mute presents features of a still more interesting character. The idea of consequences he certainly imbibes whenever the government exercised over him is unvarying whether for good or for evil. From certain acts he is deterred by his relation to certain per-

sons, and to other acts he is in the same way stimulated. Under judicious control he comes to associate in his mind a line of conduct with what produces pain, and another line of conduct with what produces pleasure. Out of this grows a sort of conscience which leads him to be sorrowful when he does certain things, and to be glad when he does the contrary. This conscience is entirely dependent upon the parent or other person to whom he is subjected. Given a good master, and he will be very likely to have a kind of moral sense that will be a safe guide in the life he leads, and will bring about habits which will be useful to him hereafter. Given a corrupt master, and the principle that in the former case would have resulted in leading him to be *good* will as certainly have the effect of making him *bad*. If the authority exercised be tyrannical, certain natures will rebel, and the most evil results will follow. If it be capricious, this moral sense will never exist. If no authority whatever be exercised at home, and he is left to his own devices, he will have as many consciences as there are persons he fears or desires to please. I have, in my mind, a boy now in the institution, whose moral education has been a work of peculiar difficulty. Though not deficient in intellect, easily pleased, and easily chagrined, no appeals to any of the higher motives seem to have the least effect upon him, not even an appeal to the affection borne him by a fond mother—alas! too fond. So far as emotion is concerned, he is not unlike Undine before she was endowed with a human soul.

From this it may be inferred that, by his own unaided uninformed intellect, and uninstructed nature, the uneducated deaf-mute does not arrive at the idea of what is really right or wrong, and is ignorant of general law, either human or divine. He may be obedient, diligent, affectionate, habitually honest, but it will be owing to the influence of kind and firm control and good example, *not* to the higher moral and religious motives that are addressed to children who hear. He is too often self-willed, passionate, prone to secret vices; but this unfavorable phase of character is generally chargeable to early injudicious indulgence, the example of evil companions, and the lack of those *higher* motives that are supplied by religious education. He is *suspicious*, because he

has been the butt of thoughtless companions. He lacks self-control, because he cannot, as well as others, appreciate the consequences of his actions. He *wishes*, as well as those who hear, to be *loved* and *respected*, and, like them, conceals his evil practices from those who he knows would disapprove of them. But he cannot distinguish between the approbation of the good, and the mere complaisance of the unthinking; is apt to mistake the laughter of the latter for applause; and, when he is thwarted in desires, the folly and criminality of which he cannot appreciate, he is apt to think himself the victim of an unjust discrimination and oppression.

The view that has been taken of the intellectual and moral condition of the uneducated deaf-mute seems to settle the question of his criminal responsibility. One who knows, and can know no more of law than what he can infer from the consequences which he has noticed are likely to follow from specific acts, who often mistakes his impulses for principles, and whose character is settled for him either by natural endowment or by the peculiar circumstances in which he may be placed, can hardly be considered as accountable in any ordinary sense of the term. Still, when he commits crime he imperils the safety of the community, and violates the sanctity of the law, whose interference must in some way be invoked.

The two great classes of crime, viz., crimes against property and crimes against person, have given rise to proceedings of a very curious and interesting character when the criminal arraigned has been an uneducated deaf-mute.

Under the first head, the crime with him usually takes the form of theft, never of fraud; though sometimes it occurs that in the indulgence of anger or revenge he will injure property to an extent that, if the offence were committed by a hearing person, would subject him to the pains and penalties of the law.

In some cases occurring in France, the plea was successfully advanced that a deaf-mute was not morally or legally responsible, and the criminals were dismissed, suffering only the detention before trial, which they probably regarded as the full punishment of their offence. They were perfectly aware that they did wrong, for they hid themselves to steal,

and hid what they had stolen. This, in itself, it may be said, hardly exhibits more proof of intellect than is displayed every day by the sheep-stealing cur; but the deaf-mute, however uneducated, always displays a keen appreciation of the rights of property—knows pretty clearly what belongs to himself, and what belongs to others; and, like children in general, is easily moved to bursts of passion by any interference with what he considers as belonging to himself. And that he steals with contrivance and in secret is a proof that he is aware that he will be punished if detected. For this class of offences, therefore, it would seem as though moral, if not legal, responsibility could be attributed to him, though his unfortunate condition should certainly move his judges to leniency in pronouncing sentence upon him. And this is the view that has prevailed in more recent cases.

There is, however, a different class of cases in which the law comes into collision with the private rights of property. For instance, in a recorded case, near Rodez, in France, officers were sent to a farm to seize property for debt. In so doing, they treated with roughness the peasant, whom they caught in the attempt to drive off his cow. The deaf-mute son of the latter, a vigorous youth of twenty, seeing, as he thought, the rights of property violated, fell upon the aggressors and soon put all three to flight. Summoned with his father before the tribunals for this grave offence against the law, he recognized in court his late antagonists, pointed them out as robbers, and was with difficulty restrained from renewing the chastisement he had inflicted on them. He carried with him the full sympathy of the public and of the jury, and was acquitted on the ground that, being entirely ignorant of the legal rights in the case, he had only obeyed one of the first laws of Nature in defending his father and his property.

The class of crimes against the person presents greater difficulty, mainly from the extreme punishment which the law inflicts upon the highest of these crimes. If human law had never assumed the high and solemn prerogative of taking human life, the question of moral responsibility would not have been invested with such interest and importance in a legal point of view. A punishment that is irreparable, and,

if erroneous, is in itself a great and irreparable wrong, startles the conscience, and leads it to demand indubitable authority for a punishment that is in no wise reformatory, and to welcome exceptions to the rule of life for life. This authority, and this rule of exceptions, are supposed to be found in the doctrine of moral responsibility and irresponsibility. It is assumed that the man who takes human life with premeditation, thereby forfeits his own, and knows beforehand that he does so, whereas he who strikes a blow in the sudden heat of passion, not intending to take life, is not responsible to the full extent of life for life if the blow proves fatal.

Another class of exceptions is that of idiots and maniacs, to whom guiding reason being denied by the act of God, they are held not to be responsible for their criminal acts, though the safety of society may demand that they be held in duress. The same principle has been naturally applied to the deaf and dumb; who, by the Roman code, being classed with idiots and the demented, in all the points of civil disability, denied the control of their own property in life, and precluded from altering its descent by will, were, by necessary consequence, classed with them also in the matter of criminal responsibility for criminal acts; being also, like them, subject to legal restraint when dangerous.

The cases in which uneducated deaf-mutes have been arraigned for murder are painfully numerous, considered in proportion to the number of this class of persons. The able and exhaustive treatise of Dr. H. P. Peet, on "The Legal Rights and Responsibilities of the Deaf and Dumb," gives the particulars of nearly a dozen such cases taken from European reports and journals, to which have since been added some in this country.¹

¹ This valuable monogram was printed in the proceedings of the Fourth Convention of Instructors of the Deaf and Dumb, which is now very scarce. A reprint for private circulation is also quite exhausted. An imperfect copy appeared in one of the numbers of the *American Journal of Insanity* for the year 1856. It is especially valuable to the legal profession, for the full details it gives of the conflicting opinions of many lawyers and judges both in Europe and America; among other points, on the ability of an uneducated deaf-mute to make a contract or to give evidence in a court of justice, and on the mode of ascertaining his wishes and taking his testimony.

The cases of Jane Campbell in Scotland, and of Esther Dyson in England, uneducated deaf-mute women, each of whom was charged with the murder of her illegitimate child, can be found in "Beck's Medical Jurisprudence." In the former case, after much argument and many doubts, the majority of the court decided that the prisoner was capable of being put upon trial; but her counsel interposed the objection that she could not be tried till it was explained to her that she was at liberty to plead guilty or not; and, as no means could be found of explaining this to her, on this mere point of technicality, the trial was stayed. In the latter case, the prisoner was judged incapable of being tried and conducting her defence, and was remanded to close custody, as in the case of a lunatic, till the king's pleasure should be known.

In neither of these cases was the decision based upon the ground of want of moral responsibility, the difficulty lying in the inability of the prisoner to comply with the established forms of legal proceedings; but we have an interesting report of a German case reproduced in the *American Annals of the Deaf and Dumb* for January, 1871, in which the accused, Johann Schmidt, an uneducated deaf and dumb shoemaker, was held morally and legally unaccountable for having killed his employer with a shoemaker's knife. It was shown that the master was a man of violent and brutal character, and that the deaf-mute felt, or professed to feel, in fear for his own life. But his defence turned mainly on the question of responsibility. His counsel urged that, "in the case of a person fifteen years of age,¹ who is endowed with all his faculties, the law doubts whether he is accountable; but the accused, in respect to intellectual development and to responsibility, is not to be compared with a hearing person fifteen years of age. The laws are not known to the accused, and no one can be tried by laws which he does not know." This reasoning had the effect to secure the full acquittal of the prisoner, who, however, seems to have been quite intelligent for one of his class, and was even able to allege distinct-

¹ So in Germany. Under English common law, we think, fourteen.

ly, by signs, in his own defence, that, alarmed by the threatening gestures of his master, "dark night came upon his mind."

Other cases have been recorded in which deaf-mutes have, sometimes openly, sometimes lying in wait, murdered those who have offended them. Their advocates generally put in the plea of absence of responsibility, but in most cases, at least those under French law, the plea has been overruled, and the prisoner put upon his trial. His misfortune, however, almost invariably moves the jury and the court, if he is found guilty, to a recommendation of mercy. In France, where a verdict of "guilty, with extenuating circumstances," has the effect to save the life of the criminal, this verdict was rendered in all the cases of deaf-mute murderers which we have seen, though one or two were marked with circumstances of unusual atrocity. The fearful ignorance and neglected state of some uneducated deaf-mutes are justly considered extenuating circumstances when there are no others.

I will close this branch of the subject by a sketch of a recent case which has especially attracted my attention, from the fact that I was summoned to appear in it as an expert :

In Ulster County, in this State, a deaf-mute boy of mixed parentage, African on his mother's side only, born in a poor-house, instead of being sent, as he might have been, to an institution, where public provision had been made for the education of himself as well as all his fellows in misfortune, was bound, during his minority, to a wealthy farmer. Certainly a great wrong was inflicted on Levi Bodine (the name given the boy by his mother, a name he himself never heard or knew), in depriving him of the means of education. And great wrong, sooner or later, generally entails severe retribution.

The boy's employer was a respectable and intelligent man, but did he ever seriously reflect that he had assumed a very high and solemn responsibility in taking charge of an immortal soul—giving color and shape by his management, or want of management, to the whole future of a lad whose strong and passionate nature might, under skilful and judicious care, have been trained to form an affectionate friend, a

worthy and useful citizen, and a sincere worshipper of the Most High? Unable to reason with his deaf-mute apprentice, or to appeal to his better feelings, his employer seems to have contented himself with constant appeals to personal authority.

One day Mr. Hasbrouck insisted on making the deaf-mute do some work which he did not wish to do. According to the statement of the latter, made in signs to the writer, and one of his colleagues who accompanied him, the master used violence to that end, and the mute, like a half-tamed lion, roused to sudden fury, slew his supposed oppressor with an axe, which he was using at the time.

We are told that great indignation was aroused in the neighborhood by this murder of a respected citizen, on what seemed slight provocation. The deaf-mute could not tell his side of the story, and there was no one to tell it for him.

When the deaf-mute homicide was arraigned before a jury empanelled to test the condition of his mind, his counsel presented the pleas of want of capacity to be tried, which they found in their books had been presented in similar cases in England.

At the opening of the trial, the prisoner's counsel claimed that he was unable to communicate with his client in any way; that it was impossible to convey to his mind the different degrees of homicide; that there was no way to inform him of his right to challenge jurors; that he could not be sworn in his own behalf, and that the law provided that no man should be tried who was not, at the time of the trial, able to understand the details of the case and prepare a suitable defence.

The district attorney, on the other hand, said that the prisoner's sanity was undisputed; there was no malformation of the brain; the neighbors and acquaintances of the accused were able to communicate with him by signs and make themselves understood. After hearing the arguments and the testimony of neighbors and the experts, Judge Hogeboom stopped the proceedings, expressing the opinion that it was of no use to send the case to a jury, and that, before the prisoner could be tried, he should be instructed. The prisoner

was remanded to the jail, but the sheriff took no pains to carry out the recommendation of the judge, perhaps from the conviction that no teacher could be found to instruct the poor deaf-mute, merely to prepare him for the gallows.

At a subsequent term of the court, the case was again brought up for trial, this time before Judge Boardman. The jury disagreed, and Bodine was left in jail. But, being quite docile and harmless when kindly treated, and showing no disposition to escape, as he had no home to go to, he was soon allowed liberty to go out by day, returning to his prison quarters at night.

There is not the least probability that he will again be brought up for trial. Meantime, he is left wholly without instruction, even the simplest religious instruction, for the rules of the institution very properly preclude any one from being an inmate who has been guilty of serious crime against the person, and there is no one in the neighborhood of the jail qualified to undertake the instruction of a deaf-mute.

This recent case in our own vicinity, added to many more remote in time and place, points to conclusions which cannot be evaded. One is the duty which society owes to itself, not only of providing for the education of all deaf-mutes, but of making it imperative upon the parent or guardian, in each case, to secure to the child laboring under this misfortune the benefits within his reach. To him it implies vastly more than the same term used in connection with the hearing child, for the latter can never be said to be uneducated in the sense in which the deaf-mute is uneducated. To the hearing child every word spoken in his presence is a means of intellectual development. Every person, literate or illiterate, with whom he comes in contact, is for the time his conscious or unconscious teacher. In fact, school gives him so small a portion of the knowledge he possesses that it may be considered rather the regulator than the source of his attainments. In learning to read and write he simply acquires the ability to recognize and express, in alphabetical forms, a language he already knows; and in studying the other ordinary branches, if educated, he but learns a few principles which account for facts of which he is often already cognizant. And, if he never went

to school, he would, under the influences prevailing in a good home or a virtuous and intelligent community, learn all that was necessary to enable him to lead a life of rectitude here, and secure the hope of salvation hereafter. To the deaf-mute, however, education means *every thing*; it means home, and hope, and happiness. It means self-control and virtue. It means the full and free exercise of all the rights, immunities, and privileges, which belong to humanity. Understanding and acknowledging his obligations to society and to God, he becomes amenable to law; and, if placed in circumstances in which his character or his conduct comes under the review of the ministers of justice, he is able, either by direct verbal communication, or by signs in which he can give full expression to his thought through a skilful interpreter, to conduct his defence and obtain all the consideration that is his due.

The State of New York has made full provision for the instruction of all deaf-mutes within its limits between the ages of six and twenty-five, and grants to those who commence at the earlier age sufficient time to make attainments which, when the intelligence of the individual is equal to it, fall little if at all short of those made by students in our higher seminaries of learning.

With a liberality, too, unequalled in this country, it has, in making this provision, given a choice of method and even of religion.

As the law now stands, all officers, charged with the care of those who, on account of poverty, are supported at the public expense, are obliged to place the deaf-mutes under their care at some one of the institutions for this class which the State has recognized. I would, however, that it should go further, and make it the duty of certain designated public officers to seek out all uneducated deaf-mutes and require that they be educated.

Another of the conclusions to which we are led is, that the treatment of criminal cases, in which a deaf-mute is defendant, should be settled by statute.

In every case that now occurs, the prosecution argues, from the intelligence the deaf-mute manifests in various ways, such as his ability to communicate by signs to a certain ex-

tent, or to obey given directions, and also from the indications he gives of consciousness of guilt, that he has moral and legal responsibility, and therefore should be brought to trial and punishment. The defence argues, on the contrary, that his condition as an uneducated deaf-mute, if acknowledged, being *prima-facie* evidence of insanity within the meaning of the law, he cannot be put upon trial even to ascertain his mental condition. If the court fails to sustain the defence in its assumption, there follows a long argument as to which side must bear the burden of proof, in which so much doubt is raised by conflicting opinions that, as occurred in the case of Levi Bodine, in which two juries were empanelled under different judges, one judge decides that it rests with the prosecution, and the other that it rests with the defence.

As it seems to me, both the prosecution and the defence are in error: the former, as to the fact that an uneducated deaf-mute can be considered responsible in any such sense that the law may visit his act with punitive treatment; the other, that he is to be classed with either the idiot or insane. Mentally and morally he is much more in the condition of a child, though his physical powers may be those of a man. And yet it may be conceived that both sides can base, if not *sound*, at least *plausible* arguments on the law as it stands. Whether this be so or not, the judge finds it difficult to expound the law in such a manner as to make it clear to the jury; and the jury, deliberating on a case which is novel in their experience, either yield to sympathies which are touched by the helpless condition of the prisoner, or terminate the case by a disagreement in their verdict.

Law is sustained by sanctions. But sanctions are worthless in the case of a human being who can never learn any thing concerning them. An uneducated deaf-mute might come under the condemnation of the law and be punished, and yet his case could have no effect upon any other uneducated deaf-mute in deterring him from the commission of crime.

It would be a very simple and easy rule of law that the guilt or innocence of an uneducated deaf-mute should be established so as to amount to a strong probability, by testimony

entirely independent of himself, and that, if he be guilty, he should be provided with a place of detention near some institution for the deaf and dumb, and receive instruction daily from such teachers as could be detailed therefrom; that, if innocent, he should be sent to the institution itself to participate in its benefits; and that, in either case, so soon as he was fitted by education to take his part in the great drama of life, he should be left free to do so, untrammelled by the fact that, at a time when he had not reached a point where he could be held morally and legally responsible, he had been brought face to face with violated law.

If this distinguished Society be induced, by the arguments that have been presented this evening, to urge upon the Legislature the enactment of such a statute, a practical result will have been secured of more value than the interest which necessarily attaches to the discussion of mental phenomena, however striking or peculiar.

ART. II.—*Materialism in its Relations to the Causes, Conditions, and Treatment of Insanity.*¹ By H. B. WILBUR, M. D., Superintendent of the New York Asylum for Idiots.

THE drift of modern science, judged by its surface, is toward materialism. The term is used in its philosophic and not in its theological sense. Not to discuss the general doctrine, I desire to make a few suggestions upon certain special aspects of the subject, that would seem to come within the scope of this occasion and this assembly. I would call your attention, then, to the effects of the practical application of modern materialistic views, in estimating the causes, conditions, and treatment of insanity.

As I am addressing an audience of practical alienists, familiar with the literature of their specialty, I will, to save time and narrow the discussion, take for my text a paper that

¹ A paper read before the Association of Superintendents of Insane Asylums at their last annual meeting, at Toronto.

has just fallen under my observation, in the April number of the *American Journal of Insanity*.

I say to limit the discussion, for I purpose, in the main, to refer only to opinions, the materialistic basis, or tendencies, or consequences of which are not always perceived by those who hold them. Still running quite parallel with these, in some aspects, are certain other dogmas, the direct outcome of an acknowledged materialism, that may be referred to incidentally.

The paper meant is one entitled "The Dependence of Insanity on Physical Disease." It was read before the Medical Society of the State of New York, at its last meeting. Its author, an ex-president of the Society, was known to that body as the Superintendent of the State Lunatic Asylum, as the principal editor of the *American Journal of Insanity*—a man of large experience in the study and treatment of insanity, a frequent medical witness in our highest courts, and accustomed to expressing his views upon the subject. From such a source, it might well be regarded as the clear and authoritative exposition of the well-settled opinions of your special profession.

That no injustice may be done the author, it may be said here that he is no materialist. He would disclaim the charge at once. In the January number of the *Journal of Insanity*, there is an article, apparently from the same pen, in which the views of Dr. Hammond, in the JOURNAL OF PSYCHOLOGICAL MEDICINE are stigmatized as "flat materialism," and then denounced in no measured terms. The paper in question is entitled "The Dependence of Insanity on Physical Disease." It may be remarked that hardly any medical man in these days would object to the general statement or proposition that insanity is frequently, or perhaps even generally, dependent upon or associated with physical disease, functional or organic; but this paper, if it proves any thing, proves that insanity is *invariably* the result of physical causes, is *invariably* dependent upon physical conditions. In other words, the prime condition, the essential element, is a pathological state.

The two are quite distinct propositions, and with practical consequences that differ still more widely. First, then, as

to the doctrine of the paper. You have doubtless all read it, but I quote a few passages (p. 397): "The true and only method by which insanity can be studied is that followed in all other diseases. The physical lesions are the subjects of primary importance. These must be studied through physiology and pathology. The mental manifestations are here secondary and dependent. . . . We say that insanity is a bodily disorder; that it is a disease of the brain. This does not imply that there is something to be thrown off in the character of some morbid entity. It simply means that certain changes have taken place in the brain or its investing membranes, which imply a departure from healthy physiological action, and that, *in consequence* of these changes, there is more or less prolonged disturbance of the mind. The physician recognizes the delirium of fever, and refers its origin to the brain." This extract, if it means any thing, means that insanity is always caused by cerebral disease, or rather always is cerebral disease, of an organic character.

(Again, on p. 385): "In insanity, therefore, we have the dominating organ always deranged in function, if not further. Whatever the cause may be, physical or mental, or whether the brain is primarily or secondarily affected, the condition in insanity is cerebral disease. Disease is what we have to deal with. Not disease of mind, for the mind, the spiritual principle, the immortal being, cannot be the subject of disease. The manifestations of the mind are disturbed and disordered when the brain, which is its organ, suffers. . . . The expression 'disease of mind' should have a place, in the nomenclature of modern medical science, with witchcraft and demonomania. They are alike the offspring of metaphysical speculation, alike misinterpretations of phenomena."

(Again, on p. 399.) He has been speaking of certain phenomena which he asserts are explainable under physiological and pathological laws. "Now, should we stop inquiry here, when insanity results? Can we admit that insanity is any thing more or less than a pathological condition, or that it lies beyond the boundaries of ordinary and legitimate medical study, and beyond the range of clinical observation or pathological investigation? Will not the patient study which

elucidates the one be likely to elucidate the other? But in the latter the mind is affected? So is it in delirium, so is it in a degree in its operations in all diseases, when the mind is affected." . . . Farther on: "We do not *treat* these mental phenomena; but we regard them simply as exponents of physical states. We hold that it is not necessary, in order to establish the physical origin (that is, producing cause) and nature of insanity, or other cerebral disease, to show that every case is of such origin and nature. If, in a single case, insanity is shown to come on as the result of a well-recognized bodily disease, and the mental disturbance disappears *pari passu* with the physical restoration, the argument is invincible."

Running through these extracts, it will be observed, the thread of argument is something like this: Inasmuch as insanity is a physical disease, of which mental derangement is only a symptom, the cause or influence determining it must be a physical one; the ultimate pathological seat must be in the encephalon; the means of cure and hope of relief must lie in remedial agencies based upon such pathology, recourse being had occasionally to the faint, indirect, and strictly reflex influences, of a moral nature.

Now, let us examine the statistics, to see the origin of insanity; or, in other words, to see what produces this bodily state, for it is upon these statistics that his opinions upon the origin and nature of insanity are professedly based. In Dr. Gray's annual report for 1863, to which he refers, and from which he largely quotes in the present paper, his present views were somewhat foreshadowed, though then less pronounced, and more deferential to those previously held by his professional brethren. He contented himself, then, with expressing the conviction that more careful observation would reveal physical causes as productive of more cases of insanity than moral causes.

A table of analysis of the causes of insanity was given in that report, covering a period of twenty-one years, in the history of the Utica asylum. This showed a decrease of moral causes from 46 per cent. to 9 per cent.; an increase of physical causes from 33 per cent. to 72 per cent. The percentage

of unascertained causes did not differ very much at the different intervals. In the paper before us, the table is brought down to 1870, inclusive. The first thing to be done is to exclude the "unascertained causes." They only confuse the lessons to be drawn from the tables, and destroy the proper ratio of percentage of the two classes of causes. For, in analyzing statistics, the value of the induction depends upon the assumption that any ratio established in the known cases will also hold good of the unknown or general population.

Table showing the Analysis and the Percentage of Moral, Physical, and Unascertained Causes as recorded in the Admission for Twenty-eight Years.

YEAR.	Analysis of Causes.			Percentage of Causes.			YEAR.	Revised Table.			Percentage.	
	Moral Causes.	Physical Causes.	Unascertained Causes.	Moral Causes.	Physical Causes.	Unascertained Causes.		Moral Causes.	Physical Causes.	Total.	Moral Causes.	Physical Causes.
1843..	128	93	55	46.38	33.70	19.93	1843..	128	93	221	58.	42.
1844..	108	93	74	39.27	33.82	26.91	1844..	108	93	201	53.7	46.3
1845..	106	93	94	36.18	31.74	32.08	1845..	106	93	199	53.1	46.9
1846..	110	95	132	32.64	28.19	39.17	1846..	110	95	205	53.6	46.4
1847..	127	189	162	29.67	32.48	37.85	1847..	127	189	266	47.7	52.3
1848..	116	160	129	28.64	39.51	31.85	1848..	116	160	276	42.	58.
1849..	100	141	121	27.62	38.95	33.42	1849..	100	141	241	41.4	58.6
1850..	88	242	37	23.98	65.94	10.08	1850..	88	242	330	26.6	73.4
1851..	110	229	27	30.05	62.57	7.37	1851..	110	229	339	32.4	67.6
1852..	117	261	12	30.	66.92	3.08	1852..	117	261	378	30.9	69.1
1853..	107	292	25	28.07	68.87	5.89	1853..	107	292	399	26.9	73.1
1854..	96	231	63	24.62	59.23	16.15	1854..	96	231	327	28.9	71.1
1855..	55	187	33	20.	68.	12.	1855..	55	187	242	22.7	77.3
1856..	45	158	39	18.60	65.29	16.11	1856..	45	158	203	22.1	77.9
1857..	31	157	47	15.19	66.81	20.	1857..	31	157	188	16.5	83.5
1858..	63	221	49	18.92	66.37	14.65	1858..	63	227	290	21.7	78.3
1859..	57	212	43	18.27	67.95	13.78	1859..	57	212	269	21.2	78.8
1860..	47	237	53	13.95	70.83	15.73	1860..	47	237	284	16.5	83.5
1861..	40	184	71	13.56	62.87	24.07	1861..	40	184	224	17.9	82.1
1862..	33	197	57	11.50	68.64	19.86	1862..	33	197	230	14.3	85.7
1863..	26	208	53	9.06	72.48	18.46	1863..	26	208	234	11.	89.
1864..	21	242	56	6.58	75.86	17.55	1864..	21	242	263	8.	92.
1865..	19	261	76	5.41	78.35	21.24	1865..	19	261	280	6.8	93.2
1866..	12	263	113	3.09	67.78	29.12	1866..	12	263	275	4.3	95.7
1867..	.....	321	80	.....	80.05	19.95	1867..	.....	.....	.....	.....	100.
1868..	.....	296	86	.....	77.49	22.51	1868..	.....	.....	.....	.....	100.
1869..	.....	378	85	.....	81.65	18.35	1869..	.....	.....	.....	.....	100.
1870..	.....	432	49	.....	85.66	11.34	1870..	.....	.....	.....	.....	100.

YEAR.	Dr. Gray's Table of Religious Causes.	Revised Table of Religious Causes.
1843.....	18.15	22.
1844.....	9.81	13.
1845.....	8.15	12.
1846.....	9.92	09.73
1847.....	7.22	11.61
1848.....	6.40	09.42

We have, then, in the revised table, the percentage of moral causes in 1843, 58 per cent.; in 1848, 42 per cent.; in 1863, 11 per cent.; in 1866, 4 per cent. For the four years since 1866, there have been 1,427 cases admitted, whose previous history was known, from all parts of the State, from every variety of natural endowment and social condition, with every form and degree of insanity, and not a single one originating in moral causes. Connecting this fact with what is affirmed repeatedly in connection with the statistics, viz., that in the increasing light thrown upon the causation of insanity, by improved means of pathological research, and more comprehensive views in the profession, the retroactive inference is unmistakable, that had these been brought to bear upon the cases of earlier record, the moral causes would have been equally wanting.

May it not be asserted, then, that this paper, if it proves any thing, proves that all cases of insanity, when properly investigated, will be found to have had their origin in physical causes?

Subordinate to the main argument of the paper is a statement of the sequences in the phenomena of insanity. The following, he thinks, "experience warrants us in assuming as fundamental starting-points." And herein I think that his views may correspond with those of many of his professional brethren. Thus, insanity more frequently has its primary origin in pathological states outside of the brain than in primary diseases of the brain, though the reverse order of physical causation may be true. But the insanity is not manifested until the brain is actually involved. That there are physical signs and symptoms, by which experience enables us to trace the progress of cerebral disease, anticipating its successive features, is very certain. But every thing in the paper, in the way of doc-

trine or suggestion, hinges upon the *invariability* of the dependence of insanity upon brain-disease for its origin and nature. But, is this proved? First, as to the causes. Let us take the question as he found it. Dr. Brigham, the first Superintendent of the New York State Lunatic Asylum, "held, with Pinel, Esquirol, and Georget, that moral causes were far more operative than physical in the production of insanity. In 1851, Dr. Jarvis, in an exhaustive paper upon the subject of the causes of insanity, sums up the statistics then accumulated, with this remark: "The moral causes are, according to the record, almost as abundant as, and probably they really are more abundant than, the physical causes."

Dr. Griesinger (in the second edition of his work, 1861) says: "The psychical causes are, in our opinion, the most frequent and the most fertile sources of insanity, as well in regard to preparation, as especially and principally the immediate excitation of the disease. We recognize, meanwhile, that this view rests not only on statistics, but also on the collective impression of many observations, which are often concealed in their most important details, or this impression would probably be a still stronger one." We have, then, on the one hand, looking at the opinions of alienists as a body, a pretty general belief that the moral causes are the predominating ones; or, at least, very commonly the sources of insanity. We have, on the other, a few members of the profession, of whose views Dr. Gray is the exponent, who deny the existence of moral causes in producing insanity.

To accept the views of causation set forth in this paper, we must either concede that the facts presented are more conclusive, or else that the arguments offered are more convincing than those which lie at the foundation of the other belief referred to.

To follow the order of the paper, let us first examine the facts presented. The fallacies that may lurk even in the table given, showing the "analysis of causes," may arise from three or four, not to mention other causes: a preconceived theory in the mind of the parties who controlled the records upon which the table is based; the difficulty in getting at the facts precisely; and, finally, in the arrangement of the facts and in the inferences drawn from them.

The bias of the mind that guided, during the last twenty years, in the collection of the statistics here embodied, can hardly be questioned. Dr. Gray frankly says, at the very outset: "I early observed that, in those cases of which full and reliable information could be obtained, the physical cause was generally found; that some change in some part or parts of the organism preceded the earliest manifestations of mental disturbance; that in those cases some diseased condition of the body, outside of the brain, generally preceded the cerebral symptoms and the consequent insanity." (When he says here cerebral symptoms, he means, of course, symptoms of cerebral disease.) The logical temper of mind, if I may so express myself, which he brings to the investigation of the subject and collation of facts, may be seen in the following passage: "We hold that it is not necessary, in order to establish the physical origin and nature of insanity or other cerebral diseases" (meaning psychical symptoms), "to show that every case is of such origin and nature. *If, in a single case*, insanity is shown to come on as the result of a well-recognized bodily disease, and the mental disturbance disappears *pari passu* with the physical restoration, the argument is invincible." (I shall return to this quotation hereafter.)

Again, it is hardly necessary to call attention to the negative and unreliable character of statistics, in the mass, collected as these must necessarily have been. With your experience, I only need to allude to some of the difficulties in the way of getting any considerable or accurate history of cases. The persons who bring the patients to an asylum are often ignorant; and, when not ignorant, with very little real knowledge of the case. The access of the disease is often so gradual; the occurrences happened so long ago; the mental and physical symptoms are so slightly deviated from the normal standard, or run so nearly parallel, that there would be a liability of mistake in assigning causes in the case of an intelligent, unprejudiced, and careful observer. By general acknowledgment, too, in many cases the insanity is the result of a combination of influences. Even when the opportunity is afforded of obtaining medical testimony, the party giving

it may either be ill prepared to discriminate properly in the matter of causation, or takes the cue for his answers from the questions sent him from the asylum. But with intelligent friends and an educated physician to observe, in any case, you then have the fact that, in regard to all subjective symptoms of mind or body, the insane person's own testimony is of little value, even when he is disposed to give it. What he should feel, he is not conscious of; and his supposed feelings are morbid or imaginary.

Dr. Brigham, who originated the tables of statistics of causation at the Utica Asylum, in his first report, thus expresses his opinion as to the proper estimate to be placed upon them: "The causes of many diseases are obscure; those of insanity are often peculiarly so. Hence, we find few authorities attempt to give any thing but the *supposed* or probable cause. We have endeavored to be as accurate as possible in investigating the cause of insanity in each individual admitted. We have interrogated relatives, neighbors, and physicians (so far as we have had opportunity), who were knowing to the cases sent to us, and have neglected no means in our power for ascertaining the exact causes of the attack. In many cases the evidence thus obtained has been satisfactory, and we feel but little doubt of the correctness of the causes assigned, *but in many others we have not obtained such evidence as to enable us to state them with confidence.*"

After six years' experience at Utica, Dr. Brigham reiterates the same opinions, in similar language; adding, "we have given a table of supposed causes, but do not attach any great value to it." In his administration, the ratio of unascertained causes was an increasing one; that is to say, he was less and less satisfied with the evidence furnished in the matter of causation. After his death, the percentage of unascertained causes fell from 33 to 10 per cent; that is to say, his successors had more faith in the correctness of assigned causes.

We may now examine the table of causes, as upon this the argument of the paper is based. As I have before mentioned, it starts with an error. It includes, in the percentage-table, the cases where the causes are unascertained. Any one

familiar with statistical tables will see that this confuses the comparison made, and vitiates the ratio or percentage. I have therefore revised the table, leaving out the unascertained causes. I also give a revised table of percentage of cases from religious excitement during the six years that Dr. Brigham was in charge at Utica.

Of the table, it is said in the paper: "Here we have a gradual and marked decrease in moral and increase in physical causes. This is neither accident nor design. It results from experience and recorded facts." And again, speaking of the number of cases attributed to religious excitement, excessive study, etc.: "These and kindred causes were recognized less and less as efficient influences in the production of disease, in the lifetime of Dr. Brigham, under the light of experience."

Let me mention a few circumstances that will modify these statements somewhat. In the first place, the year 1843 was an exceptional year. It was the year when the Miller excitement in regard to the end of the world was producing a widespread anxiety among the ignorant and excitable portion of the community. Thousands believed in the approaching day of doom, gave up all attention to worldly matters; in some cases even distributed their property and spent their time in watching and prayer. Other multitudes, without positively believing, shared the anxiety in a greater or less degree. That and the two or three succeeding years was a time of more than ordinary attention to religious matters among sects less fanatical—a period of "protracted meetings" and "revivals." After allowing for these special causes, the percentage of moral and religious causes varies no more during Dr. Brigham's connection with the asylum than might well happen without imputing to him a change in his views of causation.

The fact was, Dr. Brigham was no novice when he went to Utica, but carried with him, not only quite superior natural endowments for the position he was to fill, but a ripened experience in all questions relating to insanity. We are not, however, left to surmise as to his opinion upon the subject at any period of his connection with that institution. In the very last report he wrote, he repeated his former opinion:

"We believe that moral causes are far more operative than physical in the production of insanity"—and then added that, in his opinion, of the some sixteen hundred patients admitted to the asylum up to that time, whose history was known, less than two hundred of them could properly be attributed to physical causes.

His views, then, upon the subject of the efficiency of moral causes did not undergo a change under the light of experience, as is alleged in the paper. On the contrary, if we may believe his own words, he was only the more confirmed in his formerly-expressed views. The truth is, the change in the ratio of causes was not all the result, as it is expressed, "of the steady progress of medical knowledge deduced from patient investigation, intelligent observation, and careful analysis of facts." There were no such wonderful changes in these respects at the Utica Asylum, that should bring down the percentage of moral causes from 41 in 1849 to 26 in 1850, if that were the tendency under such conditions. The change was in the new theory of causation that came in with Dr. Brigham's successors.

As in all tables of a similar character, it must be conceded that this one is made up of part fact and part inference. Thus, while, in the last four years included in the table, all cases from moral causes have disappeared—not one remaining—yet, on consulting the records of the asylum upon which this table is based, I find that quite a percentage of the cases are put down as "from ill health produced by overwork, grief, anxiety, loss of sleep, and domestic trouble."

A patient is brought to this or any other asylum. The friends allege that the insanity came on as the result of injury of the head, meningitis, or other sufficient physical cause. It is so recorded in the case-book.

Another patient comes, and the friends of this one assign a different cause. It was from a sudden fright, excessive grief, long-continued anxiety, intense and protracted dwelling upon some especial train of thought, extreme religious excitement, or other moral cause. The superintendent, or person entering the case on the register, however, does not believe in the efficiency of moral causes in the production of insanity; there is,

at all events, now, some physical disease associated with the mental disturbance or derangement, and he goes behind the statements of these friends or informants, and records the cause, ill health from domestic trouble, or ill health from religious excitement, or what not.

We have now to add, in a certain class of cases, another stage of the succession of phenomena in insanity, as given by Dr. Gray. First, a severe mental shock, followed by anxiety or grief; then disease of some part of the system outside the brain; then disease of the brain or some positive and pathological modification of the cerebral structure; and, finally, mental derangement. Interrupt this sequence anywhere short of the last feature, and no insanity occurs. But, every day in the year, in some individual, grief, severe care, domestic trouble, anxiety, or excessive mental labor, produces ill health, and the ill health results in some disease of vital organs, and there is also some cerebral disease ensuing; but no mental derangement follows; the person is not insane. In other words, mental derangement is only a symptom of insanity, according to this theory, and yet, if this particular symptom is not present, then there is no insanity.

I have dwelt thus long upon the tables, because they are made the foundation of the general argument of the paper. Dr. Gray concedes that the weight of authority (at all events down to a recent period) seems to favor the opinion that the moral predominate over the physical causes in the production of insanity. These tables were offered as a refutation of such opinions; and, in part also, as showing that those who held the former views had themselves undergone a partial conversion to the theory he advocates, constrained by the logic of these and kindred facts.

He kindly apologizes for the mistaken notions of his predecessors, by the suggestion that it was owing to the fact that "insanity was regarded as a moral state, a spiritual or demoniacal possession, and influenced by the moon. Many of the older medical authorities refer to and describe demonomania as a form of mental disease. The disenthralment of the professional as well as the public mind, on this subject, has been slow and gradual. However, we have similar ignorance and superstition in other fields of medical research."

The thought is, it will be observed, that these eminent alienists held erroneous ideas upon the subject of causation in insanity, because they were the victims of a lingering medical ignorance and superstition. In the case of one of them, however (Dr. Brigham), this cloud which overhung and obscured his mental horizon was gradually yielding to the rays of "experience and recorded facts."

And this is offered by one who himself brings into the discussion of a strictly scientific topic, before an association of medical men, his own personal and theological opinion.

This defence or apology, however well intended, does not meet the case at all, and, moreover, is not needed. For let us look at the facts, both as related to these particular individuals to whom reference is made and the profession generally.

Pinel and Esquirol, and for that matter Dr. Brigham, were about as far removed from any disposition to defer to superstitious notions as men could well be. They were always ready and willing to follow scientific observation to any conclusion to which it might lead. Besides, the superstitious notions referred to had been dead and buried, so far as alienists were concerned, for centuries. In science generally, or in the special department of medicine, materialism is no new doctrine. At intervals, its ebb and flow can be traced as far back as the history of science goes. Moreover, human consciousness, in health or sickness, has been substantially the same, whenever and wherever civilization has so obtained as to leave any men or class of men above the necessity of a close devotion to the supply of their daily and immediate physical wants.

To all this sum of prior experience in medical science and psychological knowledge were added opportunities of observation, in relation to insanity, equal to those of our own time. Besides, in intellectual attainments, habits of mind and enthusiasm in their work, these men have had no superiors since. To talk, then, about the influence of superstitious notions upon alienists like these seems quite absurd.

But let us look at the prevailing opinion at the period preceding, say, the last twenty years.

For many years before our time, certainly, the doctrines held upon the subject of the causation of insanity have been

substantially those held, I suppose, by the majority of the profession now. These opinions were and are the embodiment of the experience and wisdom of medical men from the earliest times. It was neither believed that man consisted of body alone, or mind alone. He was a compound being, with the physical and mental nature so intimately related that the functions of the one could not be disturbed without deranging the functions of the other; and, if the disturbing cause was long continued, there was a reciprocal, untoward influence on the nature first affected; there was organic disease produced, or mental derangement, or both.

The brain was regarded as the organ of mind, the instrument through which the sensational basis of thought or mental action was received, one remove nearer the thinking *ego* than the nerves of sensation, and the organ of mind in fulfilling its purposes; behind, in course and action, the nerves of voluntary motion. Like the other and subsidiary portions of the nervous system, it is subject to all the laws, conditions, and effects of agency. In adequately estimating the nature of this compound being, consciousness is to be consulted as well as physiology.

Now, the early alienists, in studying insanity, brought to bear upon it the physiological and pathological knowledge of their times, and also the testimony of their own consciousness when under the influence of abnormal sensations, false reasonings, violent emotions, and perverted states of will. And why not?—for, the dividing line between physical health and disease is no more dubious and uncertain than the boundary between sanity and mental derangement.¹

¹ But this has been stigmatized as an “approach to the subject of insanity through the dark portals of metaphysics.” And yet it can be approached in no other way, it would seem to me. For, it may be asked, How do we know that an insane person is laboring under a delusion, insane impulse, or frenzy, except as we bring his feelings, thoughts, and acts, to the test of our own consciousness, and human consciousness generally, as to his proper ideas, emotions, and conduct, in any given circumstances, and in due relation to his past history and experience? We have certain acts, on the part of the insane man, obvious to our senses; but the insane nature or promptings to those acts are seen or inferred only by a reference to consciousness. When we say that he is not responsible for his acts, it is because we judge, from experience in the observation of similar or analogous

They saw the reciprocal influence of body upon mind and mind upon body. They knew that ill health did produce morbid feelings, and that morbid feelings would bring on ill health; and that it was only necessary to protract a reciprocal action in these respects, to have organic disease of body or derangement of mind. They thus conceived of two classes of causes as operating in producing insanity, either as predisposing or exciting causes. In singling out one as the assignable cause, and that the most obvious and direct antecedent, it was not to the exclusion of other less palpable influences, working to the same end. They knew also that insanity could not be predicated, with certainty, upon any given amount or degree of mental shock or bodily affection. Each individual, by his constitution, endowments, and habits, was a law unto himself.

In applying their ideas of causation to the prevention of insanity, they advised the proper care of the body, as well as the avoidance of the other and more subtle influences which

cases (our own personal experience failing us), that somehow, or in some way, he has lost mental self-control.

Another stage in the investigation of the subject is to establish, in a sufficient number of cases, the existence of a definite relation between certain functional or organic changes in the physical system and specific mental phenomena. It is conceded that the fact of such relation is all that can be ascertained by any research whatever. The how and the why of this relation are beyond the scope of human thought. And in this inquiry, it should be noticed, in passing, that each stage or step is as strictly a scientific one as any other. Up to this time, it is admitted that physiological and pathological investigation has gone but little way in establishing any uniform correspondence between definite physical states and special forms of mental derangement. And, to the alienist, the main, practical end of establishing this correspondence is to enable him to infer from the mental phenomena the associated pathological condition, that he may meet this, if remediable. Up to this time, also, it must be confessed that such investigations have resulted only in the conclusion that, where organic disease of the brain exists—by inference—it is still an open question whether the cerebral lesion is the cause or the result of the mental disturbance, and in such cases that there is little hope of any benefit from ordinary remedial means. That mental restoration in such cases is to be hoped for only through moral means conjoined with efforts to establish the general health. In short, it is only necessary to read the discussions at the meetings of the medico-psychologists, to be convinced that little practical advantage in the treatment of insanity has as yet accrued from pathological investigations.

experience had shown to be instrumental in inducing the condition. Dr. Brigham's reports were full of valuable suggestions upon this point.

Their mode of treatment was based upon the same comprehensive views. "Rest, nutrition, and medication," they had for the physical symptoms; but, above all, they met the manifestations of mental derangement by a judicious moral treatment. Then, as now, the majority of patients sent to an asylum were cases of some standing. The organic or functional diseases associated with the mental derangement were past the curative stage, as to direct remedial agencies. As specialists, then, while not neglecting the general remedial means common to the profession, their business was to apply the peculiar resources of their own departments.

Moral treatment, so called, acts in two ways: Thus, indirectly, in a reflex manner, proper mental exercise, when possible, contributes to the restoration of a normal condition of the brain itself; and, directly, the mind is diverted from morbid trains of thought, and its power to act in a normal way, in spite of any physical unsoundness, is increased. By these means, too, the insane individual is led to compare his *quasi* or present consciousness with that of those by whom he is surrounded, and, in some cases, with occasional glimpses of his own natural consciousness or former trains of thought.

Now, by what reasoning are these plain facts and clear evidence of science and consciousness met in this paper before us? It has been assumed by its author, it will be remembered, that those who held to the doctrine of the adequacy of moral causes were influenced by old superstitions. He then goes on to say that the effect of these old-fashioned notions was especially seen in their accepting religious excitement so commonly as a cause of insanity. He gives what he calls a solution of these cases, with the assertion, that it is, similarly, the solution of the other cases of mental disease usually ascribed to moral causes. The professed solution is only this: The decrease of the percentage from religious causes, in the Utica tables, fell from seventy-eight to six per cent. in the six or seven years of Dr. Brigham's administration. (I have shown, by revising the table, that the number of these cases is really

quite uniform.) This is the premise. Here is his conclusion: "Thus we perceive" (or therefore) "that more extended experience and more careful observation of these cases revealed" (to Dr. Brigham, understood) "the existence of disordered physical health as the efficient cause of insanity, and the religious depression, or other moral manifestation, as only exciting causes, or as incidental effects." Now, does the table show this? He adds, "This established was an important advance." But has it been established? "Rest, nutrition, medication, could then be presented, in truth, as the relief of sorrow." Observe, if you please, not one word is said about "moral treatment" in conjunction with the physical treatment. And that this is not an accidental omission, a page farther on the following language is used: "To discover, then, under such supposed moral causes that the true source of disease lies in physical disorders is equivalent to substituting rest, sleep, food, and medication, for moral reasonings, and difficult and vexed theological problems." But is there no alternative, it may be asked, in the treatment of insanity, in all its various forms, between hygienic and remedial means, on the one hand, and moral reasonings and difficult and vexed theological problems on the other hand?

Among the unfortunate inheritances of this specialty, it would seem, is the expression "disease of mind." But Dr. Gray would banish this. And yet, the question may be asked, Pray, why discard this term from the nomenclature of modern medical science, as he proposes; that is to say, if we believe, as he does (and as mankind generally have done and do), in the existence of mind as mind, and not as a mere secreted force? Even conceding the invariable presence of certain abnormal bodily conditions, or the constant sequence of phenomena, as described in the paper before us, still the characteristic feature is the mental derangement. Etymologically, mental *disease* is the precise expression to be used in such cases. As well banish the kindred terms melancholia, hypochondria, phrenitis, derangement, psychological medicine, and insanity itself. Even if the word disease had by general consent come to be used commonly in a more restricted sense, there could be no harm in its figurative use

under such circumstances. The object of language is to express ideas. Alienists like Maudsley, who can conceive of mind only as a function of the brain analogous, in its exercise, to other bodily functions, are constrained to speak of mental health as well as bodily health, of mental life as well as physical life.

Take another view. Dr. Gray believes in the existence of mind, if not apart from body, yet in its essence distinct from body and bodily functions. The mind, then, viewed as an entity, there must be conceded to it a life embracing peculiar functions, powers, and faculties, related to each other, and capable of coördination and coöperation. Upon the harmonious action of these severally, as well as upon healthful bodily conditions, must depend all normal mental exercise. It has, according to the paper before us, "spontaneity and responsibility." These involve some other attributes, and of all these it may be said, with propriety, that they are impaired, disordered, deranged, or diseased.

But, accepting extreme materialistic views of the nature of insanity and its causes, there can be no objection to borrowing terms from material science to describe it; especially as all we can know of mind, upon this supposition, must be derived, by analogy, from physical conditions.

Dr. Brigham, in his first as well as in his later reports, dwelt upon the injurious influence of excessive religious excitement in producing insanity. His views were shared by the profession generally in his time, and, I doubt not, by a majority of the profession now. To opposing this opinion, Dr. Gray devotes quite a fraction of his paper, and it seems to me with unwonted confusion of ideas. Upon this subject, I may add, he appears to stand quite alone, so far as my reading goes. The argument is not one that lies against moral causes generally. It is rather the inadequacy of excitement upon religious topics, as among moral causes, to produce any effect in the direction named. Thus he says (p. 381): "We indeed think it is safe to infer that religious anxiety is rarely, if ever, a cause of insanity. The sublime faith of Christianity is rather a safeguard against it, and is unquestionably a support under its scourging. We do not believe that insanity

is produced by this cause directly, by a profound impression made through the sentiments and emotions upon the nervous system; or, indirectly, by gradually undermining the general health." Again: "It will hardly be argued that depression is a phase of religious experience." The confusion of ideas is, that he does not discriminate between the sublime faith of Christianity and the thousand-and-one forms of religious extravagance. Or, as if the path to religious hope, and joy, and peace, was not supposed, by a large part of the religious world, to lie through a sense of exceeding guilt, etc., etc.

Even with more complacent views of what a religious experience should be, we have the ill effects of a too intense introspection upon individual life, and too long-continued dwelling in thought upon themes that pass over the borderline between the finite and the infinite.

It is no more strange that intellectual blindness should follow the protracted contemplation of any one of the divine attributes, than that loss of sight should result from gazing at the mid-day sun.

But the real dogma of the paper is stated with the most emphasis in the following passage: "We hold that it is not necessary, in order to establish the physical origin and nature of insanity or other cerebral diseases, to show that every case is of such origin and nature. If *in a single case* insanity" (that is, mental derangement) "is shown to come on as the result of well-recognized bodily disease, and the mental disturbance disappears *pari passu* with the physical restoration, the argument is invincible." Any thing more inconsistent with the demands of logic could hardly be stated. Remember the general proposition, to be proved by him, is: no physical disease of the brain, no mental derangement, no insanity. Now, nothing short of evidence that the two phenomena, disease of the brain and mental derangement, related as cause and effect, have occurred, not once, but every time, and in every case observed, leaves the argument "invincible." *Pari passu* implies also that, with constant cerebral lesions, there must be uniform psychological effects, and the reverse. The on-coming, the successive steps, and the out-going of the related phenomena, must be invariably parallel and coinci-

dent, less the inappreciable interval not yet measured between cause and effect in this specific relation. But let us apply his own reasoning when meeting what he calls the exploded vagaries of the French materialists: "In physiology (and if in physiology why not in pathology?), causes and results must bear a uniform relation; and we should have for so much grief, so many tears; for so much provocation, so much anger, and the like. Instead of having varied manifestations in the same individual as well as in different individuals, from the same causes, the manifestation should be uniform." Now, of what lesion or pathological condition, that has been found associated with a particular form of insanity, can we say that when occurring it will invariably produce the same. In the absence of this invariability the induction is imperfect—by his own showing.

But Dr. Gray expresses his belief in the spontaneity of the mind and its responsibility—of course, on the evidence of his own consciousness: "We do not look at mind from the standpoint of regarding it as nothing more than the result of cerebral action. . . . We say that insanity is a bodily disorder; that it is a disease of the brain; . . . that there is a departure from healthy physiological action, and as a consequence of these changes the mind is disturbed or deranged." The question then may be asked: If there can be no disordered action of the mind without a prior and causative disordered condition or action of the cerebral substance, how can there be predicated any healthy action of the mind without a preceding and causative normal action of the brain?¹

Herbert Spencer is quoted as if he too believed in spontaneity, though not recognizing it as a factor, in any mere natural or physical process. The fact is, Spencer does not

¹ Dr. Mandsley (p. 385), in reviewing a book of Dr. C. Handfield Jones—who, like Dr. Gray, has attempted to ride two horses at the same time, viz., a belief in the existence of mind distinct from body, and yet that insanity invariably depends upon bodily disease—thus expresses himself: "In all healthy mental life whatever, there is a bodily factor and a purely mental factor; and, in all diseased mental life whatever, there is a bodily factor and a purely mental factor. To write as if sanity is a thing of the immaterial and insanity a thing of the material world is to infer that men are furnished with brains only that they may become insane."

believe in spontaneity at all, for he has somewhere said that he can conceive of volition, but cannot conceive of will. But let us suppose a case. An individual, apparently in perfect health, experiences a sudden shock, followed immediately by some insane feeling, thought, or act. "The mind has been subjected to a stress beyond what it is able to bear." The shock itself, no matter through what avenue of sensation the impression came which produced it, is a mental state; and it may be added, no matter what portion of the nervous or cerebral substance is more intimately related to the mental action.¹ The evidences of the derangement, however expressed, are equally mental, and known only through human consciousness. But between these two phenomena, according to Dr. Gray's theory, there are assumed to be certain intervening physical conditions or stages. The existence of these intermediate stages or processes must be, from the nature of the case, presumed not proved. It is conceded that no research, no analysis, as yet, has furnished any palpable proof of their existence. Nor can there be any opportunity of observation that could positively determine it. For, suppose the intervening stage were some molecular action within the scope of microscopic vision, yet this is necessarily beyond its reach in the living subject. Or, again, suppose the intervening pathological state to be "a modification of polar relations of nervous element," as Maudsley expresses it, with what instrument or analysis is this to be detected? Or, with what mystical vision of the observer is this to be appreciated?

¹ It is not the sensation that produces the shock, but the idea momentarily associated with it. It results from an habitual association of ideas and not from an habitual succession of molecular changes. So of the predisposition, where one exists, that makes one individual more likely than another to become insane in the face of a moral shock; it may be the result of a cerebral tissue weakened by bad physical habits, or it may be the result of a moral weakness, engendered by an habitual yielding to impulse, emotion, or passion. Of the more obscure and gradual moral influences that operate to induce insanity, it is not necessary to interpolate physical links in the chain of causation, even in these. Says a writer in the *English Journal of Mental Science*: "The point to which I desire to call special attention is this: *the direct effect of depressing emotions is to lower moral tone, and to lessen moral control*, in a greater or less degree. It is the *moral* effect of a *moral* cause," etc.

Two extracts from the same author, just quoted, will show to what shifts the advocates of this theory must resort in attempting to explain all mental states, suffering, and insanity, on a physical basis; and also the confession of their inability to demonstrate in any scientific way the organic or functional changes upon which these conditions are assumed to depend: "It behooves us distinctly to bear in mind, when we take the moral causes of insanity into consideration, that the mental suffering or psychical pain of a sad emotion testifies to actual wear and tear of nerve-element, to disintegration of some kind; it is the exponent of a physical change," etc.¹

Is not this putting the cart before the horse? One might as well say that labor was the exponent of perspiration, or scorn the exponent of a curl of the lip.

But again: "It is quite true that when we have referred all the cases of insanity which we can to bodily causes, and grouped them according to their characteristic bodily and mental features, there will remain cases which we cannot refer to any recognizable bodily cause, or connect with any definite bodily disease, and which we must be content to describe as *idiopathic*. The explanation of these cases we shall probably discover ultimately in the influence of the hereditary neurosis, and in the peculiarities of individual temperament."

Now, what does *idiopathic* mean in this connection, but an affection of the mind independent of any physical disease, in the way of causation? And again, "peculiarities of the individual temperament" is only another name for the "individual neurosis," or else it means mental idiosyncrasies not necessarily dependent upon any particular neurosis.

My eye has just fallen upon a statement of the argument in favor of the invariably physical basis of insanity, by an American writer, Dr. Earl, of Massachusetts. It is what is sometimes called "an argument in a nutshell." I find it quoted in the annual report of a Western asylum as quite conclusive on the subject. It is as follows:

"Doubtless every observing and reflecting person well knows that mental influences may cause not only bodily dis-

¹ Body and Mind, p. 94.

ease, but death ; and that bodily disease may cause disordered action or *manifestation* of action of the mind. But there are probably but few who would not give their concurrence in the opinion that, in a person born with both soundness of mind and body, the mind will not become insane so long as the body retains its original health. This proposition granted, the logical consequences must follow, that, the mind being insane, we must seek the cause in corporeal maladies, and to them, in the attempt to cure, we must apply the appropriate remedies. Hence, in each case, the symptoms must be observed, and the medicines prescribed, as in any other bodily disease."

It seems to me that the logic of this argument is, to say the least, lame in one leg. Thus, if mental influences may cause bodily disease, as well as bodily disease produce disordered action of the mind, why may it not also be said that, in a person born with both soundness of mind and soundness of body, the body will not become diseased so long as the mind retains its original health? And then the logical consequence would be that, when the body is diseased, we must seek the cause in mental maladies, and treat them accordingly.

It may be said further, in this connection (and it may help to clear the subject of some confusion), that in the case of insanity, as of consequents generally, it is not dependent upon any single antecedent, but upon the sum of several antecedents. In these days of modern civilization, it is not common to find individuals who do not bear within them an inheritance of constitution, temperament, mental structure, and habits, more or less impaired or vitiated. Besides, in the history of different individuals, the order of succession in the influences culminating in insanity may be quite opposite, and thus their relative force, and the peculiar manner of their working, may differ greatly. So in this matter, as in every other, we single out one of the antecedents, that from its relative importance, or the point of time of its operation, or some other reason, appears to be the inducing agent, and call this the cause, and then speak of the others as conditions or tendencies. In doing this, if it happens that a

distinctively moral influence is assigned for the mental derangement, there is nothing, as yet, in the results of physiological or pathological research to allege against it.

When, for *cause*, the word *basis* is substituted (as it sometimes is), and it is then said that the basis of insanity is always a physical one, this is a mere begging of the question. It is an assumption, as a fact, of the very point to be proved.

Attention may be called, in passing, to a circumstance that seems somewhat peculiar. Here are two classes of theorists, whose several doctrines and methods have somehow become transposed, so that the method of each is apparently the outcome of the belief of the other. I can think of no better illustration than that decussation of fibres that occurs at the base of the brain, by which impressions originating in one or the other side of the cerebral structure expend their activities in the opposite side of the body. Thus we have one party believing that mind is a mere resultant from physiological action of the brain, and derangement of mind an effect of the pathological condition of the same; and yet believing in the influence of moral causes in the production of insanity, and relying largely on moral treatment in the cure of insanity. On the other hand, we have the author of this paper repudiating zealously these materialistic views of the nature of mind, and at the same time denying the efficiency of moral causes in mental derangement, and professedly putting little faith in the moral treatment of insanity.

The two leading ideas of the paper, reversing the order in which they are stated, are as follows: 1. The inherent, essential, constant, and characteristic element in insanity is a morbid action in the cerebral structure, and this diseased condition is always precedent and causative of the mental derangement. 2. The non-efficiency of moral causes in the production of insanity.

Dr. Gray not only believes that the former is true from the observation of the past, but that future pathological investigations will make it demonstrably certain in every form of insanity. Thus he says: "We believe that physiological science will so advance that every process in the complex phenomena of physical life, in health and disease, shall be

read and revealed and understood." Cherishing these views, as a matter of prevention, he thinks there is little occasion to guard and admonish individuals and society against those habits of thinking, and modes of feeling, and yieldings to impulse and passion, that undermine the mental health, as the violation of physiological laws breaks down the physical constitution. As a matter of treatment, the only course he suggests is one of "rest, nutrition, sleep, and medication."

From this paper, it would appear that the only idea of *moral treatment* he has, or would put in practice, is developed in the following passage :

"We do not treat the mental phenomena which appear as indices of the cerebral disorder ; but we point out to the patient his changed mental condition, and endeavor to show him that his delirious conceptions are delusions, and result from the morbid condition of his brain ; and that, with restoration to health, these delusions and misconceptions will vanish. Many may be convinced of this ; and, though the delusions do not disappear with this conviction, yet persons may, and often do, so far keep constantly in mind their true condition, and exercise such control, as largely promote their recovery. The mind by this effort uses the brain ; and, by the exercise of its legitimate dominating power, moderates its action in some directions and increases it in others. The mind exercises choice, and controls itself, and by limiting and modifying its use of its organ, the brain, aids in the restoration of that organ."¹

Maudsley, whose writings would seem to have shaped the views of Dr. Gray in some respects, differs widely from him in these last-mentioned opinions. He makes some admirable suggestions for the moral treatment of the insane in the last

¹ Says Dr. Gray, on page 23 of his pamphlet : "We knew '*spontaneity*' to be a reality of our own consciousness, and yet, in the language of Herbert Spencer, it is impossible to make this spontaneity a 'factor' in any mere natural or physical process whatever." If, then, "the mind exercises choice, and controls itself, and limits, and modifies its use of the brain, thus aiding in its restoration to health," it would seem as if spontaneity, in spite of Herbert Spencer's opinion, could be made a factor in a natural and physical process.

chapter of his book, from which I borrow a couple of passages: "When insanity has become chronic, or when fixed delusions are established, there is small hope of special benefit from drugs. The general health being duly attended to, a systematic moral treatment will be best adapted to restore health of mind." After showing the principle which should guide, i. e., a proper diversion of the mind from the morbid trains of thought and feelings, he adds: "If there is some fixed delusion, it will do no good to enter upon any systematic argument against it; there would be almost as much hope of an argument against the east wind, or against a convulsion; but, by engaging the mind in other thoughts as much as possible, and thus substituting a healthy energy for the morbid energy, the force of the delusion will be most likely to abate and finally to die out."

It might be suggested at this point that, reasoning backward from effect to cause, the success of moral treatment, in certain cases of insanity, might be an argument, not to say an invincible one, that moral causes might have been efficient in producing them, and that without the intervention of any physical agencies. So, too, some of the modes in which Reason assumes her throne after derangement point to the same view. Says Griesinger: "Sometimes recovery resembles simple waking; when the individual, astonished, seeks as it were to know himself, the masses of ideas belonging to the disease soon disappear, and the old idea returns uninjured and unimpaired to its former place."

Take another fact, that, according to the best authorities, mental shocks or violent emotions have not unfrequently brought a sudden termination, not to say cure, to even insanity of long standing. Sometimes such shock acts directly upon the mental status, and at others indirectly through the physical system.

Holding theoretical views such as are set forth in the paper under discussion, we should expect to find that the method of treatment adopted at the asylum under the management of its author would be correspondingly shaped and moulded. What the treatment at Utica has been, and is now, may be gathered from the annual reports of that institution.

In its early days the moral treatment was made very prominent, as the reports of Dr. Brigham show. Nor did he neglect the varied resources of the medical art in meeting the physical symptoms either underlying or associated with the mental derangement. Not only in his reports, but in his other writings, he laid great stress upon keeping a sound body to secure mental health; and, when the balance of the mind was lost, he showed the importance of efforts at reëstablishing the physical health as the first step toward sanity.

Since his day, I think it may be said that discoveries have been made that bring out in a more clear and definite light what was formerly spoken of as sympathetic action in disease, that is, the frequent occurrence of affections once supposed as originating exclusively in the nervous centres, that are now known to be owing to a reflex influence through peripheral nerves, from distant organs. Of course, this changes the direction of the remedial efforts of the physician.

Judging by the reports of Dr. Gray, referred to, it may be said that the somewhat elaborate means of moral treatment adopted by Dr. Brigham have been gradually given up, or rather, given place to general remedial means. The theory is, that at the basis of most cases of insanity is an anæmic condition of the system, and that the especial organic or functional disease, upon which the derangement primarily depends, originates in this.

"The great indications for treatment, therefore, are nutrition, sleep, rest. The medication is mainly directed to secure these, by sustaining, stimulating, and invigorating the nutritive functions, in order that the system may be able to receive and assimilate the requisite amount of aliment for building up and renewing the tissues, and to calming agitation, allaying irritability, and controlling the inordinate cerebral action, that due rest and sleep may be obtained."

"The average per cent. under medical treatment during the year 1865 was 43 per cent." (I name this year because full statistics are given in the report for that year.) "The greater portion of the feeble and broken-down, represented as under regular medical treatment, are on remedies administered with a view to building up the general health, and but

a small number (7 per cent.) on soporifics alone. The prescriptions daily made, independent of those for patients on the list of the above table, average 14. per day." In other words, $2\frac{1}{2}$ per cent. of the patients have a special medical treatment.

Dr. Alexander Robertson, of England, in describing his visit to the Utica Asylum, and the treatment there, says, quoting Dr. Gray: "Persons suffering from chronic melancholia are permitted to do very much what they choose, within the bounds, of course, of their own safety, and that of others, for a long time, at first—six months or a year, perhaps—attention being directed principally to the promotion of their nutrition. When their physical state improves, then, and not till then, they are asked to occupy their attention in work," etc. (or other forms of moral treatment).

There is a free use of malt and spirituous liquors, the vegetable tonics, phosphoric acid, with nightly soporifics when needed. It is, in short, class treatment instead of individual and special treatment.

Such is the treatment that prevails at Utica, as one reads it in the annual reports of that institution for the last dozen years. It is the natural outcome of the "physical-basis" theory of insanity and of that view of causation that rules in its management.

Twenty years ago, the superintendents of American asylums for the insane, in one of their annual conventions, adopted unanimously a resolution that the highest number of patients that could be treated *with propriety* in one institution was two hundred and fifty, while two hundred was the preferable maximum. And also that for the former number of patients one medical superintendent and two medical assistants were needed. This was in the days of a belief in moral causes and mental disease, and a faith in moral treatment, either alone or in conjunction with appropriate hygienic and medical means. This embodied the experience and wisdom of a generation of alienists. A supposed necessity or expediency induced this same association, at a later day, to modify its views upon these points, and we now find all over the land institutions, two or three times as large as was then proposed. As a con-

sequence, with the limited number of medical officers, it has been almost impossible to make a study of individual cases in their medical and psychical aspects. At all events, it has been very much easier for those in charge to permit their patients to do very much what they chose for six months or a year, attention being directed principally to the promotion of their nutrition, till their physical state improved.

Think what a variety of conditions complicate the problem of cure in the case of every insane man or woman; and then multiply this by the number of cases to be regarded possibly curable in an asylum like that at Utica, with six hundred or more patients! And remember that, practically, these are under the charge of two physicians; for the superintendent's general duties, at the head of a community so large, responsible for the care of the building and supplies, and the general conduct of the assistants of every name, his occasional absences in attendance upon the courts, leave him little time for the medical supervision of the institution. For the third medical assistant there are the multifarious duties of the supernumerary in such a case; the record of cases, the statistics, the pathological investigations, etc., etc.

It will be seen from this—and Utica is but the type of many another asylum for the insane—how naturally alienists may have drifted into this “physical-basis” theory of insanity; have lapsed into the condition of mere doctors of medicine in the narrow sense. In this connection let me quote from Maudsley's chapter on the treatment of insanity, which is full of admirable suggestions:

“It now remains to speak of the means to be adopted for the care and treatment of the insane who are deemed curable. This treatment is moral and medical, the two methods being properly combined in every case. Again, it should be specially directed to the character and circumstances of the individual case; it is necessary to penetrate the individual character, in order to influence it beneficially by moral means, and to investigate carefully the concurrence of conditions that have issued in insanity, in order, so far as possible, to remove them. Not the least of the evils of our present monstrous asylums is the entire impossibility of any thing like individual

treatment in them. It would not be putting the matter fairly to point out the absurdity of two medical men affecting to treat really seven or eight hundred lunatics in an asylum, because the majority of them assuredly do not require any medical treatment; but it is perfectly fair to call attention to the uncertain chances of satisfactory treatment which the small, curable minority have under such circumstances. To the medical officer these are not so many *individuals*, having particular characters and particular bodily dispositions, with which he is thoroughly acquainted, but they are apt to become so many lunatics, whom he has to inspect as he goes his round of the establishment, as he inspects the baths and the beds; and the only person, perhaps, really aware that each of them has an individual character, is the attendant. Herein lies a reason why the best possible treatment in some instances undoubtedly is to remove a patient from an asylum to the care of his own friends. . . . Indeed, I cannot help feeling, from my experience, that one effect of asylums is to make some permanent lunatics; continually living in the atmosphere of the worst lunacy, certain patients seem to become impregnated with its baneful inspiration, and after a time sink to the situation. And I can certainly call to mind more than one instance in which I thoroughly believe that the removal of a patient from an asylum was the salvation of his reason."

Could not the term "absurdity," applied above, be used with still more force, in a case where, practically under the direction of but two medical men, six hundred patients are supposed to be treated; and all these, under the law, regarded as curable cases, and, at all events, 70 per cent. of whom have been insane less than a year.

Says Griesinger: "Nowhere is the desideratum strictly to keep in view the individual of greater importance than in the treatment of insanity; nowhere is the constant consciousness more necessary that it is not a disease, but an individual patient—that it is not mania, but an individual who has become maniacal—that is the object of our treatment. Each individual case should be specially investigated in all its bearings, which constantly vary, and all the means of anatomical diagnosis and pathological research ought to be brought to bear upon its elucidation; in fact, a penetration into the psychical

individuality of the patient is here demanded, which is scarcely ever necessary in ordinary medical practice."

In the annual reports of the asylum at Utica, it is said with complacency, that "its records will show that full pace has been kept with the general progress of medical science—that moral or medical remedies have been discarded or adopted, as soon as investigation or experience has shown them to be evil or good. The proportion of attendants to patients has been nearly doubled, and in all respects the institution has sought to adopt at once whatever has seemed essential to the more certain and speedy recovery of patients, or which might contribute to their more humane treatment. It has always maintained a foremost rank in all the great improvements in sanitary measures."

In short, every means and appliance, that money could supply, has been at the command of its management. The annual cost of board and maintenance of the patients is certainly up to the average of the other State institutions of the country. It is claimed that the method of treatment, based upon the modern theory of the causation and nature of insanity, is a very great improvement upon that in vogue twenty years ago; and in reading the paper, and seeing with what zeal and earnestness the peculiar views and methods of the author are commended to the profession, one almost wonders that the insane in former days were cured at all. Certainly, during the period named, important remedies have been added, empirically or otherwise, to the resources of the specialist in insanity.

That homely old proverb, "The proof of the pudding is in the eating," has an application even in relation to medical practice. I therefore, in closing, present some of the statistics of the Utica Asylum, from its establishment. It will be borne in mind that the records cited have been kept under the supervision of the author of the paper, for the last eighteen years, or nearly two-thirds of the whole period.

It will be seen that, consistently with the changing views of the managers, the cost of medical supplies has been constantly an increasing one. In the six years of Dr. Brigham's administration, the average annual cost of medicine and medical supplies, for each patient, was \$1.15.

General Statement of the Operations of the New York State Lunatic Asylum for the Twenty-seven Years ending November 30, 1869.

YEARS.	Number admitted.	Number discharged.	Number treated.	Discharged recovered.	Discharged improved.	Discharged unimproved.	Discharged, not insane.	Died.	On Average Population.			On Admissions.			Percentage of Improved on Admissions.	Cost of Medicines and Medical Supplies.	Cost of Medicines per Patient.
									Average Population.	Recovered.	Percentage.	Admitted.	Recovered.	Percentage.			
1843	276	80	276	53	14	6	...	7	106	53	48.52	276	53	19.20	05	\$126 85	\$1.19
1844	275	211	471	132	47	16	...	61	236	132	55.93	275	132	48.80	17	283 02	1.11
1845	293	268	563	135	78	34	...	21	265	135	50.94	293	135	46.07	27	323 70	1.22
1846	337	248	622	133	60	33	...	22	283	133	46.99	337	133	39.46	17	467 16	1.65
1847	428	330	802	187	70	25	...	48	415	187	45.06	428	187	43.60	16	432 41	1.02
1848	405	382	877	174	84	38	...	86	474	174	36.70	405	174	42.96	21	439 73	.92
1849	362	408	857	203	66	70	...	69	454	203	44.71	362	203	56.07	08	569 01	1.25
1850	367	387	816	171	57	108	...	51	483	171	39.49	367	171	46.59	15	1756 65	4.06
1851	366	360	795	58	38	57	...	24	440	112	28.45	366	112	36.60	08	757 89	1.73
1852	390	400	825	156	53	152	...	39	441	156	35.37	390	156	40.00	14	650 05	1.47
1853	434	403	849	169	66	129	...	39	423	169	39.95	434	169	39.88	16	642 96	1.52
1854	390	386	836	164	42	115	...	65	444	164	37.16	390	164	42.06	11	1163 05	2.99
1855	276	278	735	128	15	79	16	32	467	128	27.40	276	128	46.54	06	2363 68	5.06
1856	242	236	697	100	33	85	8	30	454	100	22.24	242	100	41.73	14	1080 91	2.38
1857	235	245	606	95	25	83	10	32	468	95	20.52	235	95	40.42	11	1234 55	2.88
1858	333	282	784	114	33	90	5	31	489	114	23.31	333	114	34.23	10	9043 04	4.18
1859	312	295	814	114	57	96	3	35	509	114	22.40	312	114	36.54	18	2399 38	4.71
1860	337	339	856	105	56	133	3	42	516	105	20.33	337	105	31.15	16	2096 59	4.06
1861	295	280	812	83	58	104	4	31	519	83	15.99	295	83	27.96	20	2406 32	4.64
1862	287	305	819	106	51	115	3	30	526	106	20.15	287	106	36.93	18	2776 55	5.28
1863	287	267	801	80	38	101	6	42	528	80	15.15	287	80	27.87	13	2784 47	5.37
1864	319	289	853	109	44	94	4	48	560	109	19.46	319	109	31.02	14	4545 85	8.12
1865	356	305	920	113	35	91	9	57	591	113	18.95	356	113	31.74	10	4367 76	7.22
1866	388	362	1003	164	39	106	9	44	643	164	25.50	388	164	42.26	10	5874 96	9.13
1867	401	439	1042	159	58	164	7	51	610	159	26.00	401	159	39.65	14	5253 43	8.61
1868	382	415	985	157	85	105	10	58	589	157	26.65	382	157	41.00	22	4137 90	7.02
1869	463	430	1033	156	85	117	8	64	600	156	26.00	463	156	33.69	18	4464 89	7.44

Statistics of Three Massachusetts Institutions.

YEAR.	Cost of Medicine.	Average Population.	Average Cost per Patient.	Recovered, Percentage.	Dismissed Improved.	Dismissed not Improved.	Deaths.
1867.....	\$2,535 74	1169	\$2 18	43	25	13	19
1868.....	2,596 43	1172	2 49	35	30	15	20
1869.....	3,261 57	1183	2 73	36	32	18	14
1870.....	3,108 06	1192	2 60	34	33	19	14
Average.....	\$3,948 44	1179	\$2 51	37	29	16	17

In the last six years, the average annual cost of the same articles, for each patient, has been \$7.94. Of course, some of this difference is owing to the increased cost of these articles; but, with this allowance, it is obvious that the difference is mainly owing to the more liberal use of medicine and stimulants than formerly, in the treatment of insanity.

The statistics given of the Utica Asylum also show that the percentage of recoveries, during these later years, whether based upon the whole number treated, the average population, or the number of admissions, has not been an increasing one. In making the comparison also, it may be mentioned that, of the four hundred and sixty-three cases admitted in one of these years (1869), 20 per cent. had been insane less than one month, 40 per cent. less than three months, and 70 per cent. less than a year. In that respect, the circumstances were favorable for recovery.

I also give the partial statistics of three Massachusetts institutions—all I have at hand—which would seem to indicate that the medical treatment, when pushed, is no more successful than when less vigorous medication is adopted.

In citing these results in the case of the Utica Asylum, I would not be understood as presenting them to prove that they are less favorable than in the case of other institutions during the same period, but as showing that the modern system of treatment, based upon the exclusively "physical-basis" theory of insanity, is no more successful than in former times, though it must be conceded that the resources in the way of remedial agencies have been greatly enlarged. Let me quote from the proceedings of a meeting of the British Medico-Psychological Association, held about a year ago: "Dr. Howden wished to know on what authority Dr. Tuke made the statement that the proportion of recoveries was the same under the old system of restraint as it was now."

"DR. TUKE: I don't think that I said so. I said, 'it is said that it was,' and I have not been able to disprove it."

In closing, I ought to apologize for the somewhat disconnected manner in which I have treated my subject. It has resulted, in part, from the attempt to express my own convictions, while reviewing the opinions of another; and, in part, because I wished to be as brief as possible.

I desire especially to excuse myself for a too controversial tone and manner in the utterance of my convictions. I regret this more, because I may have seemed, to some of my hearers, to be attacking the author of the paper, when I have only aimed to controvert his opinions.

ART. III.—*Medico-Legal Points in the Case of David Montgomery.* By WILLIAM A. HAMMOND, M. D., Professor of Diseases of the Mind and Nervous System, and of Clinical Medicine, in the Bellevue Hospital Medical College, etc.

In the spring of the present year I was requested by the District Attorney of Monroe County, in this State, to read a transcript of certain evidence which had been adduced at a preliminary examination in the case of David Montgomery, indicted for the murder of his wife.

Upon a careful consideration of this evidence I gave it as my opinion that epilepsy of itself was not sufficient to destroy responsibility, and that, though the prisoner had probably suffered from occasional epileptic seizures, there was nothing to show that the crime of which he was accused was in any way the result of such a paroxysm. On the contrary, the circumstances appeared to indicate that the prisoner acted with deliberation and full reason. I, however, stated that I could not give a definite opinion on these latter points without examining the accused.

A preliminary examination had been made before a jury to determine the mental condition of the prisoner, the law of the State of New York not allowing of the trial of a person not of sound mind. A commission, composed of physicians, examined him, and, though they reported that he was insane, other testimony to the contrary was given, and the jury disagreed on the question submitted to them. As this result was equivalent in law to a declaration of sanity, the trial was ordered to take place. The result was a conviction of murder in the first degree. The medical experts who supported the theory of the prisoner's insanity were Dr. Cook, of the asylum at Canandaigua, and Dr. Gray, of the Utica Asylum; those who thought differently were Drs. Moore and Montgomery, of Rochester, and myself. Two careful examinations of the prisoner left no doubt on my mind of his entire responsibility for the murder. At the same time, there was no question that his intellect was undeveloped, and that he had had occasional paroxysms of epilepsy. There was, however, no mental aberration, and the circumstances of the deed and

his subsequent conduct were such as to shut off all idea of unconsciousness.

It by no means follows that an individual suffering from epilepsy is not as fully responsible for his actions as healthy persons.

Reynolds, who has written the best work on the subject in the English language, states that the disease in question, even when fully pronounced, does not necessarily involve mental change. In thirty-eight per cent. of his cases the mind was unaffected in any way.

He further declares that, while considerable intellectual impairment exists in some cases, it is the exception and not the rule.

And also that ulterior mental changes are rare.

Falret, in his valuable essay on the "Mental State of Epileptics" ("L'État mental des Épileptiques") says: "The first question which naturally presents itself to the mind, relative to the medico-legal relations of epilepsy, is this: Should all the epileptics who commit criminal acts be regarded as insane, and therefore irresponsible? Some physicians, laying too much stress on the eccentricities of character and of conduct observed with the majority of epileptics, even with those who have preserved all the appearances of reason, declare for the affirmative. They contend that the simple proof that an individual is suffering from epilepsy is sufficient to acquit him of criminality; as not having enjoyed mental freedom at the moment of accomplishing the act imputed to him. A doctrine so absolute cannot be accepted without reserve. It extends, to boundless limits, the sphere of irresponsibility, and, if generally adopted by physicians, would greatly lessen their authority in the eyes of magistrates, who will never admit that the sole fact of epilepsy is sufficient to absolve an accused person. Physicians who only observe the epileptics of insane asylums may be inclined to adopt this absolute opinion. In fact, notwithstanding the essentially intermittent character of the intellectual troubles with epileptics, the frequent repetitions of the accessions of delirium leave generally, in the minds of those who experience them, evident and durable traces even in the intervals of the paroxysms. But when we do not restrict our observation to the epileptics

who are contained in lunatic asylums, when we extend it to all those who live in society without any one suspecting the existence of this disease, it is impossible not to accord to a certain number of epileptics the privilege of moral responsibility, if not during their whole lives, at least during a long period of their existence.

“The question, therefore, of the responsibility or irresponsibility of epileptics cannot be defined in an absolute manner, since we must consider certain epileptics as guilty of the acts imputed to them; at certain periods of the disease, the appreciation of this responsibility becomes extremely delicate in each particular case.

“Thus the only practical manner of putting medico-legal questions relative to epilepsy and mental alienation is that which has been hallowed by custom. Was the individual of sane or insane mind when he committed the act for which he was arraigned before the bar of justice? If he was insane, he ought to be considered irresponsible; if not, he ought to be condemned as guilty.”

It is very certain, therefore, that the mere fact of the existence of epilepsy in a person accused of crime is not sufficient to abrogate responsibility. My own experience abundantly supports this view; and it is well known that some of the greatest men who have ever lived and who were remarkable for their intellectual vigor—Julius Cæsar and Napoleon Bonaparte, for example—were epileptics. Cases have been under my observation in which the disease had lasted for many years without apparent mental derangement or failure.

It frequently happens that the insane in lunatic asylums are at the same time epileptics. But insanity with epilepsy is a very different thing from the insanity which results from epilepsy. It is for this reason that Falret, in the foregoing quotation, attaches little importance to the views of asylum physicians on this subject. And his opinion is the more valuable, as he is himself the superintendent of a large asylum in France.

The essential feature of an epileptic paroxysm, whether it is of the *grand mal* or *petit mal* variety, is unconsciousness. And though occasionally in aborted seizures there may be a kind of semi-consciousness present, the other phenomena of

the attack are so characteristic as to be perceived by the patient.

In all fully-developed paroxysms unconsciousness is the essential feature, and without it there is no epilepsy. The individual attacked has, therefore, no recollection of any thing which has taken place during the seizure, and the mere fact of such recollection existing is very certain evidence that there was no paroxysm.

There is no case on record of a crime being committed by an epileptic during a paroxysm, and the recollection of it being present.

Crimes may be committed by epileptics without responsibility under three different conditions, and no others: 1. Either as a consequence of mental imbecility resulting from repeated attacks of epilepsy. In such a case the condition of the individual would be one of dementia, and he would be incapable of judging of the consequences of his act, and the act itself would be without motive. 2. During the state of high maniacal excitement which sometimes follows an attack, and in the otherwise insane precedes it, in which case the act would be indeterminate. 3. During the state of unconsciousness resulting or attending upon the paroxysm. In this case there would be no subsequent recollection.

In a paper on "Epilepsy and Homicide," written by Dr. Isaac Ray in special reference to the Winnemore case, and published in the *Journal of Insanity* for October, 1867, the author says: "If the deed was committed under the influence of his disease, supposing the charge to have been true, we are necessarily led to inquire what particular phase of it was present. No one supposes that his mind was generally so impaired as to be incapable of discerning right from wrong, of knowing that murder is forbidden both by human and divine law, or of controlling the fullest impulses of passion. The act could not have sprung from such a condition as that. Neither is there any ground for the supposition that he was under the domination of that blind fury so frequently exhibited by epileptics before or after a fit, or that his mind was overpowered by apprehensions of dangers, or a sense of persecution and outrage from persons, real or imaginary, about him. Nei-

ther of these phases of the disease had he ever exhibited ; and, though it is not impossible, perhaps, that the latter occurred on this occasion for the first time, there is not the slightest reason to believe that such was the fact. We then come to the only other epileptic condition in which the act could have happened, that of utter unconsciousness, and, though we have no direct evidence respecting it, neither are we met by any circumstances of the case that would render it impossible. He had been in this state more than once before, and it was one of its incidents that he had no idea whatever of what he thought or did while in them."

The case of Fyler, the first time in this country in which epilepsy was used as a defence, who was tried in Onondaga County, N. Y., in 1855, for killing his wife, was also one in which there was entire want of recollection of the murderous act. In both Winnemore's and Fyler's cases the prisoners were found guilty. In the first, the penalty was inflicted ; in the latter, a medical commission pronounced the prisoner insane, and he was committed to the lunatic asylum in Utica.

In the case of John Reynolds, tried over a year ago in New York for murder, the attempt was made, after conviction, to prove the existence of epilepsy. I examined the prisoner several times before and after the trial, and was satisfied that the crime was not committed through the influence of that disease. He was executed.

In the case of Chambers, who shortly afterward committed a murder in Brooklyn, the plea of insanity was set up. I was requested by the district attorney to examine the prisoner. I did so, and found no evidence of epilepsy beyond the statements of Chambers himself. On his trial another physician testified to the presence of epilepsy. Through a misadventure, I did not get to the court to testify, and the prisoner was acquitted and sent to the lunatic asylum at Utica. He presents no signs, as I have been informed by Dr. Gray, of having any form of mental alienation or epilepsy.

The prisoner Montgomery is twenty years of age, has followed the occupation of a carter, and has never been suspected of mental derangement, dementia, or epilepsy, by those who knew him, outside of his own family. Several members of the

family, however, testified, in the previous proceedings relative to his sanity, that he had been subject to epilepsy since infancy, but the commissioners could only satisfy themselves that he had had three attacks up to the time of the homicide ; therefore it may easily be assumed that, notwithstanding the possible existence of epilepsy, his mind has not in consequence of such disease undergone marked deterioration.

At the age of about eighteen he married ; but had lived upon bad terms with his wife, who had been a prostitute, and who insisted upon returning to her former occupation. A week before the homicide she left him, taking with her their child, eight months old. On the evening of the day (Saturday) before the homicide, Montgomery went to her mother's, where she was stopping, and persuaded her to return home with him. They arrived at their own home about twelve o'clock at night, and she was killed the next morning between the hours of six and eight. Many of these particulars, as well as the subsequent ones, are derived from the statements of the prisoner.

From these statements it appears that they awoke early in the morning and began to talk of their difficulties. He told her that, if she would remain at home and stop going with other men, he would forgive her. She replied that she would not, that she was a prostitute when he married her, and he knew it, and that she had always been one and always would be one. He replied that he had made up his mind that, if she would not live with him, she should not live with any one else. He then got out of bed, partially dressed himself, and went to his father's house, a few rods distant, and took from the back-yard an axe, with which he returned to his own residence. On entering the room where his wife was he found her asleep. He stood by the stove a few minutes, deliberating whether he should kill her or not. Finally he determined to do so, and then struck her on the head, just above the left temple, inflicting a mortal wound, of which she died.

He then left the house, and, meeting a younger brother in the street, told him what he had done, and then taking a razor from his pocket attempted to cut his throat. In this effort he was prevented by his father and brother, and was

by them persuaded to give himself up to the police. On his way to the jail he stated to the officer that he had at first thought of going to Canada after killing his wife, but, concluding that he would be caught, he had determined to give himself up.

In these particulars there is no one fact indicating insanity, dementia, or epilepsy, besides the fact of voluntary confession and surrender. This, unaccompanied by other evidences of mental aberration, is of little importance, and is materially lessened in its force by the opinion of the prisoner, as expressed to the policeman, that he thought he would be caught if he attempted to escape.

As regards temporary insanity from morbid impulse, there is no evidence to show that Montgomery had exhibited any indications of mental derangement during the few days preceding the homicide. The facts of the dispute, the repugnance he entertained to his wife's conduct, the deliberation with which he went to his father's house for the axe, and reflected, as he stood by the stove, in regard to his purpose, are at direct variance with any such idea.

They are equally against the idea of such a condition of dementia or imbecility as to indicate a want of knowledge of his acts and their consequences.

As to epilepsy, the circumstances of the affair are absolutely irreconcilable with the theory that the homicide was perpetrated during a paroxysm or an accession of epileptic mania. Instead of a blind fury, there was deliberation; instead of a purposeless act, there were motive and provocation; instead of unconsciousness and subsequent want of recollection, there was complete knowledge of all the circumstances, even to their minutest details; instead of subsequent confusion of ideas, there was distinct recollection.

Admitting that Montgomery has been subject to repeated attacks of both the *grand* and *petit mal*, it is very evident that these were not sufficient to injure his mind to any appreciable extent.

The hereditary tendency to insanity would be of importance if the prisoner had himself, in the perpetration of the homicidal act, or before or after, shown signs of mental de-

rangement. In the absence of such signs, it is of little importance.

The prisoner, as stated, was convicted of murder in the first degree.

A motion for a new trial was made by the prisoner's counsel, and, among other reasons which he adduced, was the fact that I had been paid a large sum to come to Rochester and testify in the case. The views of Judge E. Darwin Smith, before whom the case was originally tried, are so exactly in accordance with those now held by all enlightened jurists, relative to compensation to medical experts, and are so fair to myself and the district attorney, Mr. Davis, that I subjoin them without comment:

"The next allegation of irregularity is 'that a medical witness, Dr. Hammond, was produced and gave testimony in the case on the part of the people, by the procurement of the district attorney, under a contract that such witness, not being a poor witness, nor a non-resident of the State, should be paid a consideration of five hundred dollars for attending the court and giving his testimony, and was paid that sum of money, and this without the knowledge of the prisoner or his counsel until after his testimony in the case was closed.' Upon this statement of facts I cannot perceive upon what ground or principle an allegation of irregularity can be based or sustained; but it is doubtless due to the importance of the case, the character of the question involved, and to the consideration of what is due to the proper administration of justice in respect to public prosecutions, that the facts contained in the affidavits produced should be more fully stated and considered. From the stenographer's notes and our own minutes of the trial, we know that the fact and body of the crime for which the prisoner was tried was very clearly proved, and was really undoubted and unquestioned, and that the only defence set up and sought to be established at the trial was that of *insanity*. It appears from the affidavits read on this motion that the case was put over the last February term of this court, upon the allegation that the defendant was insane, and a commission of distinguished physicians was fixed and agreed upon by the attorney-general and the counsel for

the prisoner, and assented to and appointed by the court, so far as it had power to do so, to ascertain by inspection and otherwise, and report whether the prisoner was or was not insane; and it also appears and was well known that the case also went over the April term to allow an inquiry to be instituted, and that such inquiry had been instituted by the county judge, with a jury, under the statute of 1842, to ascertain whether the prisoner was or was not insane—upon which inquiry the jury were unable to agree.

“The case, therefore, was necessarily prepared for and came on for trial at the present adjourned term of the Oyer and Terminer.

“The prisoner, to prove and establish his defence of insanity, called a number of distinguished physicians, and the people also called several physicians upon that issue, and among others Dr. Hammond. In respect to the attendance of Dr. Hammond, particularly as a witness, the facts stated in the affidavits are in substance as follows: The affidavit of the counsel for the prisoner states that preparatory to such court he ‘was induced to write to Dr. Hammond, of the city of New York, and sent a gentleman to see him a few days before the court to inquire (not as to his opinion, but) whether he would come and examine and testify in the case;’¹ that he received information in reply that he was coming at the request of the district attorney, and would be present; that the trial began on Wednesday, May 17th, and on the following morn-

¹ The purport of the counsel’s inquiry will be best judged of by a perusal of his letter to me at the time, and which I subjoin. The sincerity of his opinion relative to compensation of expert witnesses may probably admit of some question, in view of the contents of this letter.

ROCHESTER, N. Y., *May 12, 1871.*

DEAR DOCTOR: I am to defend David Montgomery, charged with the crime of murder, the trial to commence on Tuesday next, in this city. I wish to examine you as an expert witness. If you will be here on *Wednesday morning*, I will release you *Wednesday night*.

I send you, through my brother, the testimony and opinions of physicians, including Drs. Gray, of Utica, and Cook, of Canandaigua, taken on an examination to determine whether Montgomery had intelligence enough to be tried. The jury disagreed, *I have pressed a trial*. I wish the case to be ended. I have not the slightest doubt that the alleged murder was an insane act. The prisoner struck his wife a single fatal blow with an axe while she was asleep, kissed her, and proceeded to cut

ing Dr. Hammond arrived in the court-house, as the counsel was opening the case for the defence; that he saw Dr. Hammond at noon of that day, and was informed by him that he wished to examine the prisoner, and would make an impartial examination, and he also saw Dr. Hammond the same evening, and had considerable conversation with him about the case and the condition of the prisoner; that before the prisoner closed his case, he called Dr. Hammond as a witness for the prisoner and examined him at some length, and that the people recalled him in reply when he was further examined; that on Tuesday, the 23d of May, while the counsel for the prosecution was summing up the case for the people, he received information that the district attorney had contracted to pay Dr. Hammond five hundred dollars for coming to Rochester and testifying in behalf of the people; that during the recess at noon he inquired into the facts and found that a warrant of the treasurer had been drawn in Dr. Hammond's favor, and paid, for five hundred dollars; that Dr. Hammond was then a resident of the city of New York, and that his reasonable expenses could not exceed fifty dollars, and that on the coming in of the court after the recess he called the attention of the court to the fact in the presence of the jury, and that such payment had been made as above stated with the sanction of the court, which was admitted by the district attorney and not denied.'

"The affidavit of the district attorney on the same subject states in substance that, preparatory to said trial, he took all

his own throat with a razor, and was arrested in the act. This was on Sunday, the 13th November last. He made no attempt at escape or concealment. Soon after, he stated that it was his temper, he supposed, which led him to kill her; that he loved her, and she was resolved to be a prostitute. (I think this was true.) Within an hour he stated that he felt compelled to kill her. Shortly after noon, he was quite unconscious of the act, and it is my conviction *has now* no remembrance of it whatever. The evidence sent to you shows that he has been subject to occasional fits of epilepsy. Still, he has been a strong young man (now twenty years old), and has labored faithfully and well, the neighbors not knowing generally that he was ailing. His friends are poor, but I shall see that you are fairly compensated. The newsmongers and police want an exciting trial and execution, and, to my surprise, have created some prejudice against the young man. Hence the necessity of fortifying the case by the opinions of able and humane men. Please telegraph to me to-morrow.

Truly yours, J. H. MARTINDALE.

the testimony which had been taken before the county judge as above stated, and went to the city of New York and laid the same and the whole case before Dr. Hammond, and asked him for his opinion upon it, and, learning from Dr. Hammond that he could not give him a satisfactory opinion without seeing and examining the prisoner, he inquired of him upon what terms he could be induced to come to Rochester and make such examination and attend the trial as a witness; and, learning that he could not be induced to come for any thing less than five hundred dollars, he left him, and consulted the district attorney of the city of New York, and the United States district attorney of the southern district of this State, the late Judge Davis, on the subject of the propriety of engaging Dr. Hammond to come to Rochester and attend the trial at the price aforesaid, and was advised by both of said officers that it was customary for district attorneys to employ and pay experts in professional life like Dr. Hammond, and that his charge was reasonable in view of his high reputation and extensive practice in his profession; that deponent then returned home, and consulted the judges of the court of sessions, and several members of the board of supervisors of Monroe County, and also two of the justices of the Supreme Court of this district, on the subject, all of whom advised him that they thought that, as the public prosecutor for the county, he would be justified in making the proposed arrangement to secure the attendance of Dr. Hammond at this court, and advised him to make such arrangement.

“The district attorney further states in his affidavit that on Monday before the trial he informed the counsel for the prisoner that Dr. Hammond would be present at the trial as a witness for the people, and that after his arrival General Martindale had frequent interviews and consultations with Dr. Hammond during the progress of the trial, and took the doctor to his house to spend an evening; and that after such interviews, intercourse, and consultations, the said counsel called Dr. Hammond as a witness for the prisoner, and improved him as such, and that he is informed, and believes, that it is customary throughout the State for the courts to pay professional witnesses for their time, expenses, and services,

as in this case, upon the application of the district attorney of the county, and that deponent had no other object in calling Dr. Hammond except to elicit the truth before the jury.

“Upon these facts we do not see that the calling of Dr. Hammond as a witness, and the payment to him of a sufficient sum to secure his attendance at the court during the trial, was in any respect an irregularity, or did any wrong to the prisoner. It seems to us that the district attorney was acting in the line of his duty as public prosecutor in securing the attendance of a proper medical witness of high repute to meet the distinguished medical experts which he knew the prisoner expected to call on his side. The question at issue in the trial was chiefly a medical one, in respect to which the opinions of medical men would be likely to exert a great if not controlling influence. The witnesses who had testified before the county judge, and those also who had acted on the commission, were among the most distinguished members of their profession upon the particular questions involved on the trial. Those witnesses the prisoner was expected to call in the trial, and the district attorney would, it seems to us, under the circumstances of the case, have been derelict in his duty to the people of this county if he had not taken the requisite steps to secure the attendance of witnesses of equal distinction and consideration in their profession, on the part of the people. The district attorney, it is true, might have required the attendance of Dr. Hammond on subpoena, but that would not suffice to qualify him to testify as an expert, with clearness and certainty, upon the questions involved. He would have met the requirement of a subpoena if he had appeared in court when he was required to testify, and given proper *impromptu* answers to such questions as might then have been put to him in behalf of the people. He could not have been required under process of subpoena to examine the case, and to have used his skill and knowledge to enable him to give an opinion upon any points of the case, nor to have attended during the whole trial, and attentively considered and carefully heard all the testimony given on both sides, in order to qualify him to give a deliberate opinion upon such testimony as an expert in respect to the question of the sanity

of the prisoner. Professional witnesses, I suppose, are more or less paid for their time, and services, and expenses, when called as experts in important cases in all parts of the country. The question what amount is paid, or agreed to be paid, in such cases, cannot affect the regularity of a trial. It may perhaps properly affect the question of their credit with the jury. In this case it appears that the facts in respect to the employment and payment of Dr. Hammond were fully and publicly stated in the presence of the jury before the case was given to them, and were well known to them, and may have, and must have had, such influence with them as they thought proper to give to them under the circumstances of this case. We do not, therefore, think they present any ground for a new trial, as a question of irregularity or otherwise.

“The prisoner’s counsel also ask for a new trial on the ground of surprise in respect to the testimony of Dr. Hammond, and of newly-discovered evidence.

“So far as relates to the question of newly-discovered evidence, the application is based upon several affidavits showing that the prisoner has had a fit in the jail since his trial, and it is claimed that this fact tends to show that he did not simulate, on the trial and before, the appearance of an insane person.

“On this question the allegation is in substance that the testimony of Dr. Hammond tended to show that the prisoner’s appearance of indifference and apparent unconsciousness on the trial was assumed or feigned, and that the proof of the fit had at the jail, since the trial, tends to refute such evidence. This is not new evidence in kind or degree, and is really nothing but cumulative testimony on the main issue. Much testimony was given on the trial, proving that the prisoner was accustomed to have fits, had numerous fits in his infancy, and in his earlier years, and a few later in life, and one in the week previous to the homicide; and this evidence was not questioned or doubted. Proof of another fit occurring after the trial could not affect the question, particularly on another trial. It is not newly-discovered evidence within the rule applicable to such cases, that the newly-discovered evidence to warrant a new trial must be material, and to go to the

merits and not be cumulative, collateral, or corroborative, and such as ought to produce on another trial an opposite result on the merits. (*Vide* 'American Criminal Law,' section 3,161.) Such we think quite clearly would not be the effect of making proof of this fit at the jail, just as it is presented in the several affidavits read and produced on this motion.

"On the point of *surprise*, the facts above stated, and contained in the affidavits of the counsel for the prisoner, and of the district attorney, we think do not show that the prisoner's counsel had any just ground of complaint or of surprise, in a legal sense, in respect to the testimony of Dr. Hammond. The counsel for the prisoner states that he advised his client to submit to examination by Dr. Hammond, and that he did submit to such examination, and that Dr. Hammond did not fully disclose to him the whole of such examination. The defence of insanity set up for the prisoner necessarily subjected him to the test of medical examination. I do not see how Dr. Hammond, seeking to make an examination of his person to ascertain the state of his system, his health, and the symptoms of mental disease, as a witness and expert, called in behalf of the people, could properly be denied such an opportunity. To have refused to allow it would have been a virtual admission that such defence was unfounded, and that the appearance of the prisoner in his person and conduct, giving color to such defence and relied upon in part to sustain it, was simulated for the purpose of such defence. The counsel for the prisoner had constant intercourse with Dr. Hammond during the trial, and, finally, virtually took him away from the prosecution, and appropriated him as a witness for the prisoner, by calling him as such witness, and examining him as far as he pleased. Dr. Hammond, so far as we could see, answered all the questions put to him by the counsel, on such examination, with frankness and explicitness; and we cannot see that it furnishes any ground for the complaint of surprise, that he gave further and fuller testimony afterward when called by the prosecution. The fact stated in the affidavit of the counsel, that, when he so called him as a witness, he was ignorant that he had made a contract with the district attorney to appear and testify as a witness, on the part of the prosecution, for the sum of five hun-

dred dollars, cannot, that we see, affect the question of surprise. Certainly the learned counsel knew that Dr. Hammond came to Rochester to examine the prisoner, and attend the trial as a witness in behalf of the people, and upon the employment of the district attorney. It could hardly have been supposed that he came voluntarily, and spent so much of his time, without some compensation, and such compensation to be paid necessarily from the funds of the county, at the instance and upon the application of the district attorney.

“Within the rule applicable to cases of surprise, in respect to the proceedings of a trial, we do not see any basis of fact, upon which the court would be justified in granting a new trial on this specific ground. We cannot see that the prisoner’s case was affected injuriously by any essential surprise in law or fact, or by any accidental or unforeseen occurrence, during the trial, to his prejudice. And, upon the whole case, we think the motion for a new trial should therefore be denied. Motion denied.”

I submit these views and opinions of Judge Smith without further comment, though there are several statements made by the prisoner’s counsel which are based more on fancy than reality.

ART. IV.—*The Development of Religious Ideas.* By JAMES J. O’DEA, M. D., of New York.

AVAILING ourselves of Mr. Tylor’s recent learned and elaborate work on “Primitive Culture,” we will attempt, in the following pages, a brief sketch of the development of religious ideas.

As all, or nearly all, the testimony to be adduced in support of our view of this subject is taken from contemporary savage life as observed and described by intelligent travellers, its claim to consideration needs to be established before we can proceed in our argument.

What ground is there, then, for assuming that the religious beliefs of contemporaneous savages represent the religious condition of primitive man ?

Science, supplemented by history, shows a march of central parts of the globe forward from the savage toward the civilized state. The progress here meant is a fact amply verified by geology and archæology, for both testify to the successive ages through which, from the drift (Palæolithic) epoch to the iron age, the portion of the human race now referred to has passed to its present condition. But, from man's known intellectual and material progress, it is fair to infer his religious progress also, since, as a matter of general experience, both go hand-in-hand, and since it is not a probable hypothesis that savage or barbarous man can be in possession of a system of natural religion, of indigenous growth, in advance of his natural state. Now, travellers point to outlying peoples still in a savage, barbarous, or at least stationary condition. Why are they so? Because, as a rule, they are too remote from the centre of activity to be influenced thereby. They are prototypes—with some allowance of course for such slight advances as they themselves have made—of the primitive intellectual and social state of civilized man; but, if of his primitive social and intellectual state, consequently of his religious condition also. Therefore, we may employ reliable testimony as to the state of belief among contemporary savages, to illustrate the religious condition of prehistoric nations, with a view to showing that out of this latter many of our most important religious conceptions have been developed.

As regards its origin, the subject of religious belief may be considered from two points of view: either as a revelation from God—using the term revelation in its common sense—or as a continuous development out of the primitive conceptions, needs, and experiences of man. The former is the opinion of theologians; but the latter, fruitful of important results in the hands of ethnographers, is that which we shall trace in this paper.

The chief interest of the whole discussion centres around the true origin and development of the idea of God. The theological position on the subject, early taken up, has been pretty closely adhered to. It is to the effect that God made a direct original revelation of Himself to man, and that the image so produced has been perpetuated in the minds of all

subsequent generations, blurred and defaced, to be sure, by sin and faithlessness, yet only needing renewal by accident or reflection to be represented in consciousness in unmistakable reality. But, that there are peoples who have no notion of God, and seem never to have had any, there is ample testimony to prove. Father Dobritzhoffer, a zealous Roman Catholic missionary, states the theological view, and his own experience of its untenableness, in the following words: "Theologians agree in denying that any man in possession of his reason can, without a crime, remain ignorant of God for any length of time. This opinion I warmly defended in the University of Cordova, where I finished the four-years' course of theology begun at Gratz in Styria. But what was my astonishment, when, on removing thence to a colony of Albipones, I found that the whole language of these savages does not contain a single word which expresses God or Divinity! To instruct them in religion it was necessary to borrow the Spanish word for God, and insert in the Catechism "Dios ecnam coagerick," "God the Creator of all things."¹ Father Baegert, for seventeen years a missionary among the Indians of California, affirms that "idols, temples, religious worship, or ceremonies, were unknown to them, and they neither believed in the true and only God nor adored false deities."² Colden says the five great nations of Canada had no word for God. Examples have been adduced, it is true, "to show," as Mr. Tylor says, "that monotheism underlies the native creeds of North America," but they are unreliable, owing to the impossibility of discriminating, without a more critical examination than they have yet received, between what is indigenous to them and what they owe to Christian sources.

A reverse view of the question has been urged of late days by excellent authority, and supported by an ample array of facts. This view holds that belief in a *Supreme personal God* is attained only by ages of slow growth in culture, and after the human mind has passed through well-known stages of intellectual improvement and expanding religious conceptions. It holds that as man has had to toil slowly on the road from

¹ Quoted from Sir J. Lubbock's *Prehistoric Times*, second edition.

² *Ibid.*

barbarism to civilization, so, with equal slowness and labor, he has progressed from the lowest forms of superstition to the most sublime religious conceptions. As we find relics of barbarian laws and customs surviving even to the present day, so we meet with strange features in our religious system, which, when traced back to their origin, are discovered to be links of the chain connecting us with the rude spiritual conceptions of remote ages. Many of these features are preserved in tradition and folk-lore. They crop up too in daily life, reminding us of a time when they doubtless fully expressed the faith of our ancestors.

But this progress points also to a something without which it could not have been, to a basis in human nature on which, if not out of it, religious belief has thus slowly developed. The various ethnic religions of the world are not the product either of priestly cunning or of political ambition. But they are the product of man's intellectual and moral wants, of a need which he feels and has always felt of something to satisfy his mental and spiritual cravings. In so far as modern research declares for this basis, it is treading on firm ground; but by rejecting it, as there are some indications of an attempt to do, it will cut itself off from the only rational explanation that can be offered of the existence of religious ideas. It seems to us, therefore, that all precise treatment of this subject must assume as a fact the existence of a religious element in man's nature, out of which the beliefs characteristic of his religious progress are evolved. With regard to the nature of this element, we can only say that it is an intuition by which outward facts are apprehended in their religious light, i. e., in their relations to the mysterious problems of final causation and human destiny.

Mr. Tylor commences his discussion of animism by asking whether there are or ever have been "tribes of men so low in culture as to have no religious conceptions whatever?" The right answer to this question will, of course, depend on what we mean by religious conceptions. If we intend thereby such religious ideas as obtain among civilized races, we make a serious mistake, and yet this is the very sense in which travelers and some able advocates of the theory of development

have understood the expression. Sir J. Lubbock, thus limiting the scope and meaning of religion, and insisting that the lowest grade of his idea of it is higher than its actual state as observed among certain savages, declares: "If the mere sensation of fear, and the recognition that there are probably other beings more powerful than man, are sufficient alone to constitute a religion, then we must, I think, admit that religion is general to the human race."¹ But, by refusing to acknowledge this as a stage of religion, it is easy for him to conclude, to his own satisfaction at least, that religion is not universal. If this be religion, "we must admit," he writes, "that the feeling of a dog or a horse toward its master is of the same character; and the baying of a dog to the moon is as much an act of worship as some ceremonies which have been so described by travellers."² The radical defect in this line of reasoning lies in the conventional meaning which Sir J. Lubbock and those who agree with him attach to the word religion. They forget that it has a more exalted signification with them than it can have among savages. They make the belief and worship of civilized communities the standard by which they judge the claims of all savage religions to recognition. This, however, is not a tenable position, and, in fact, it is disproved by examples which might be taken from their own works to show a comparatively elaborate system of belief among savages whom they would yet declare to live in a non-religious state. For instance, Dr. Lang,³ after asserting of the Australians that "they have no religion or religious observances to distinguish them from the beasts that perish," yet records that they believe small-pox to be caused by *Budyah*, a malicious spirit, and that in robbing a wild beehive they leave some of the honey for an offering to their god *Buddai*. Notwithstanding, therefore, the great deference which is due to the opinion of Sir J. Lubbock, we cannot help thinking that however degraded some savage beliefs and systems of worship may be, they are certainly more worthy of the name religion than "the baying of a dog to the moon."

Sir J. Lubbock, *Origin of Civilization*, p. 121.

² *Ibid.*

Queensland, p. 340; quoted from Tylor's *Primitive Culture*.

We may characterize the first stage of religious belief as superstitious in the extreme, i. e., as accounting for all phenomena, subjective as well as objective, on the hypothesis of the existence and intervention of supernatural beings. Not a leaf stirred nor a spring bubbled, not a breeze sighed nor a tempest roared, but as the several acts or manifestations of spirits residing in tree, water, wind, and cloud. The very atmosphere men breathed was thick with them. Certain acts, as yawning, were restrained by this belief, for it was feared lest, in a moment of unguarded indulgence, evil spirits might gain unwelcome admission into the body. Spirits were believed to preside over all the chief events of life—birth, marriage and death, for example—and also as special guardians to keep watch over the conduct and fortunes of individuals and families. Many incidents in the life of the individual, as sickness, dreams, visions, and presentiments, were explained on the same belief. Man was everywhere the sport of invisible beings, who dealt out to him good or evil according to their own inclination. Surrounded, hemmed in by this invisible world of spirits who visited upon him, as he would gather from his hard lot, chiefly anxiety and privation, it is natural to picture him instinctively assuming an attitude of watchful suspicion toward them. But, discovering, after many failures, the impossibility of defending himself against foes so unassailable, he would change his tactics—he would adopt the cunning expedient of endeavoring to appease their enmity by offerings and supplications. Hence the general primitive custom of gifts and sacrifices. Mr. Tylor gives a different explanation of the origin of these religious rites; but, in our opinion, it is more properly applicable to a higher stage of animism.¹ Theologians have drawn from the custom of sacrificing proofs of man's intuitive sense of his own unworthiness, of his sinfulness, and of his need of a means of reconciling himself with an offended Deity.² But, taken at its true value, for what it indicates irrespective of strained interpretation; it only explains the savage idea of the causes of natural evil, and what remedies

¹ See his article on the Religion of Savages, *Fortnightly Review*, August 15, 1866.

² See Dr. Newman's Essay in aid of a Grammar of Assent.

were believed most effectual in averting it. To infer from his paralyzing dread of unseen agencies a sense in him of estrangement from the Deity by sin, or, from the custom of sacrificing, his yearning for a restoration of the lost union, is to credit him with conceptions far in advance of his condition. "The religious theories of savages," writes Sir J. Lubbock, "are certainly not the result of deep thought, nor must they be regarded as constituting any elaborate or continuous theory."

The primitive belief thus referred to has been named by Mr. Tylor *animism*, or the doctrine of spiritual beings. They are classified as—*a*. Souls of men, animals, plants, and inanimate things; *b*. Active, intelligent spirits, dwelling outside of matter.

Primitive man believed, as do the savages of to-day, that all objects had souls. But, besides, there were extra-terrestrial spirits, who determined natural manifestations by direct interposition. All the affairs of life were in their hands, from the most trivial to the most important, from the most common to the most unusual. They were deemed the causes of events, the guides of their course, and the influencers of their issue. They were sympathetic spectators of human actions, feeling pain or pleasure according to their ideas of right and wrong, and, at their arbitrary will, visiting man with the consequences of their friendship or enmity.

In tracing the sources and development of this system of belief two facts will, we trust, be established:

1. That its roots lie in the spiritual needs of man, and that its growth keeps pace with his psychical development.

2. That it is the germ of all more developed ethnic religions. Hence our inquiry will follow the line indicated by the following questions: How did this system of belief originate, or out of what facts and experiences in human nature was it evolved? What other beliefs does it lead to in the course of its natural growth and development?

Directly the savage had attained to powers of observation and reasoning, certain recurring experiences, engaging his attention, would cause him to speculate on their origin and meaning. For example, he would dream. Scenes near and far, friends living and dead would visit him in the silent hour, converse with, and even impart to him hints and warnings

which, if filled out by subsequent experience, would seem prophetic. Reflecting on these experiences, he would hit on an explanation, which, as his first essay at a philosophy of things, might be the beginning of all his truer and nobler religious conceptions. And this explanation itself would proceed from the fact that primitive man attaches an equal degree of credence to his subjective as to his objective experiences. The subjective state called dreaming is to him a real world wherein he actually passes through his dream-experiences. An amusing example of this belief is given by Sir J. Lubbock in his recent work on the "Origin of Civilization." A North-American Indian dreamt he was taken captive. On awaking, so strongly was he impressed with the reality of what had been passing through his mind, that he urged "his friends to make a mock attack on him, to bind him, and treat him as a captive, actually submitting to a considerable amount of torture, in the hope to fulfil his dream." Now, dreams are explained on the hypothesis that something in the dreamer, not subject to the conditions of matter, went out from him as he slept. Hence, he necessarily makes a distinction between matter and spirit, and learns at the same time that he is composed of both. The following examples will show the existence of this belief, and at the same time place it in a stronger light :

Cranz remarks of certain Greenlanders that they believe "the soul quits the body in the night, and goes out hunting, dancing, and visiting; their dreams, which are frequent and lively, having brought them to this opinion. Among the Indians of North America, we hear of the dreamer's soul leaving his body, and wandering in quest of things attractive to it. . . . The New-Zealanders considered the dreaming soul to leave the body and return, even travelling to the region of the dead to hold converse with its friends. . . . The Tagals of Luzon object to waking a sleeper, on account of the absence of his soul. The Zulu may be visited in a dream by the shade of an ancestor, the *itongo*, who comes to warn him of danger, or he may himself be taken by the *itongo* in a dream to visit his distant people."¹

¹ Tylor's *Primitive Culture*, vol. i., p. 397, *et seq.*

But what of the world of his dreams? Is it not a real world, and are not the spirits peopling it realities also? Yes, he has seen the one even to many of its minute details, and both seen and conversed with the other. To this world his soul went on its night excursion, and there held intercourse with its ghostly inhabitants while his body lay wrapped in sleep. Thus, faith in the objective reality of dreams would lead to belief in a soul, in extra-mundane spirits, and in a world beyond the grave. Death also, and other conditions intermediate between life and death, would afford further proof of the same truths. Savages had observed the respiration of men and animals. On cold, raw days they could see the breath issue as a white smoke from the mouth and nostrils. This breath was the soul or spirit, and its possession made all the difference between life and death. Men died because this breath left them—"died from loss of breath" is still among children a smart way of accounting for dissolution. There were those who could testify to having seen the spirit take flight at the last moment, and others who could tell of the visits they had received from the souls of the departed. They came in dreams, sometimes in a loving, at other times in an angry and revengeful mood. When one of the Basutos of Africa is haunted by the apparition of a deceased relative, he sacrifices a victim on his tomb to appease him. So also sickness was occasioned either by a temporary loss of the soul or by the invasion of an evil spirit. Recovery only took place when the soul, returning, resumed its old seat and function, or when the evil spirit was exorcised. Consequently the primitive art of healing consisted in efforts on the part of the sorcerer or medicine-man to restore this lost connection with all possible speed, or to expel the intruder. "When a Chinese is at the point of death, and his soul is supposed to be already out of his body, a relative may be seen holding up the patient's coat on a long bamboo, to which a white cock is often fastened, while a Tanist priest by incantations brings the departed spirit into the coat, in order to put it back into the sick man. If the bamboo after a time turns round slowly in the holder's hands, this shows that the spirit is inside the garment" and of course may be restored to the sufferer.

¹ Tylor's *Primitive Culture*, vol. i., pp. 395, 396.

The nature and attributes of the soul next become a subject of speculation and study. Various will be the questions concerning its nature, its existence out of the body, its abode and state after death. At first there will be a belief in its materiality; for, was it not evident to some of the senses? The eye could take in its form and the ear its small, chirping voice. Various customs survive to illustrate this phase of belief. Apertures are made in new graves for souls to escape through to the world beyond. The Chinese make a hole in the roofs of their dwellings for the same purpose. Savages shout and beat with sticks to scare ghosts away. They flourish a handful of twigs over the head of a widow to "drive off her husband's ghost, and leave her free to marry again." We are told by Mr. Tylor that "Congo negroes abstain for a whole year after a death from sweeping the house, lest the dust should injure the delicate substance of the ghost;" and that, even to the present day, the German peasant fears to slam a door, lest he should pinch a soul in it! Thus, the modern conception of the soul as an immaterial principle is seen to be foreign to the savage mind.

Again, the question of the existence of the soul apart from the body will also have its phases of progress. At first it will be regarded as conterminous with the body, living and dying with it, or, if not then dying, surviving only for the short time which it spends around familiar scenes of earth. But its matter is of a subtler kind, and, though subject to the law of death, it is capable of resisting it longer. The old dead are dead indeed, but the lately-mourned are still near by. "Ask the negro," says Du Chaillu, "where is the spirit of his great-grandfather, he says he does not know; it is done. Ask him about the spirit of his father or brother who died yesterday, then he is full of fear and terror; he believes it to be generally near the place where the body has been buried, and among many tribes the village is removed immediately after the death of one of the inhabitants."

At every step in the study of primitive conceptions of the soul, hints crop up which gradually expand into more or less precise statements regarding a future place of existence. A belief in such a place would necessarily follow from the notion

of a spirit leaving the body. Its full development could not be attained, however, until the soul was no longer regarded as mortal and material. The growth of the notion of eternal duration in a future life would keep pace with the progress of belief concerning the spirit, until it had reached its final stage in the correlative conceptions of immortality and infinity in time. Various incidental facts would aid this progress, as the transmission of the worship of particular deities from generation to generation, a custom which would itself accompany the gradual accretion of families, and houses, and tribes, to form the commonwealth.

The same process of development may be traced in primitive ideas regarding the dwelling-place of departed spirits. By some savage tribes this is believed to be on the earth, in various places difficult of access, among mountains, valleys, and remote islands. In North-American-Indian tradition, the Bridge of the Dead is a passage-way prepared for souls on their journey to the future land in the West. Catlin describes it as a long and slippery pine-log, with bark stripped off, stretched from hill to hill across a deep ravine, at the bottom of which flows a swift stream. Over this dangerous road the spirits of the dead must pass on their way to the delightful hunting-grounds.

The condition of souls in the future state is a reflection of what it was on earth, even so much as their social grade and individual peculiarities being there faithfully reproduced. This includes a belief that the accidents and mutilations of the body are reproduced in the soul. The aborigines of Brazil believed that the soul "arrived in the other world wounded or hacked to pieces," according to the lot of the body in this life. "The Australian who has slain his enemy will cut off the right thumb of the corpse, so that, although the spirit will become a hostile ghost, it cannot throw with its mutilated hand the shadowy spear, and may be safely left to wander, malignant but harmless."¹

But, as the sense of the mystery surrounding the future life deepens in the savage mind, the habitation of souls will be placed farther and still farther away. Accordingly, though

at first, perhaps, entirely limited to the immediate neighborhood of the earth, their abode is afterward transferred to some distance, generally across the ocean, in the direction of the setting sun, where, according to the vision of the Algonquin chief, there is neither cold, nor war, nor bloodshed, "but the creatures run happily about, nourished by the air they breathe." England, Mr. Tylor tells us, was one of the sea-girt lands chosen for this purpose. Thither souls of the dead were conveyed in shadowy boats by spirit-fishermen, from the bleak North-German coast.

Hades is another and more distant bourne of departed souls. Its situation is sometimes in the interior of the earth, in caverns, having openings of communication with the living world; sometimes beneath the earth, in a world which this planet, then considered flat, was supposed to overlie. The author of "The Coming Race" did not violate ancient tradition, how much soever he may have offended the æsthetic sense, in placing his newly-discovered society in the bowels of the earth. The imagination of savage man had long ago bodied forth such a state of existence, and the popular belief in it had survived into classic times, running through the poetry of the ancients from Hesiod to Virgil. The Samoan islanders believe that, when one of their number dies, "the host of spirits that surround the house, waiting to convey his soul away, set out with him, crossing the land and swimming the sea, to the entrance of the spirit world. This is at the westernmost point of the westernmost island, Savaii, and there one may see the two circular holes or basins where souls descend, chiefs by the bigger, and plebeians by the smaller, into the regions of the under world."¹

The visible firmament, with its apparent limits, its depth of blue, and its wonderful luminous bodies, has been a chosen place of souls from the remotest times. Its floor was a solid arch enclosing the earth; in it were set the stars, and above it disported the beatified souls of men. The North-American Winnebagos had a beautiful tradition, that the "Milky Way" was the path of souls in heaven. The modern Iroquois pictures the departed spirit going ever upward, till it glides out

¹ Tylor's *Primitive Culture*, vol. ii., p. 60.

on the plains of paradise, "where it sees people, trees, and other objects, as on earth."

As Mr. Tylor observes in the work we are making frequent reference to in this article, the fate of these various traditions has not been uniform. Belief in the earth as the abode of souls is confined to the savage state; that in hades, or the interior or underpart of the earth, survives to the present, and retains a firm hold on the Christian world; that in heaven, or a place above the firmament, faintly indicated in the savage state, grows stronger as we approach to barbarism, and predominates in civilization.

Thus the beliefs respecting the survival of the soul and a future state are found intimately associated both in conception and development. Their progress is so simultaneous that it is impossible to study one apart from the other.

The following summary will present what we have already said on this part of the subject, in a comprehensive form :

1. The existence of a tribe or nation void of any religious conceptions, though not impossible, is unknown. The first phase of religious belief is, probably, animistic and spiritualistic.
2. Souls and spirits have at first only a limited existence in time after the death of the body.
3. A distinction is at length drawn between the spirits of good or great men and of the common herd. The former are declared immortal; they have a place assigned them in the spirit-world. The latter are mortal, perishing out of existence and the memory of man. According to Feejeean belief, few spirits live forever, because so few have powers of attaining to immortality. This notion is sometimes expanded into a belief even in future retribution, as where Catlin informs us that the good walk safely over the log-bridge (already described) to the hunting-grounds, while the wicked, trying to dodge the stones thrown at them by the six persons on the far side of the ravine, fall and are dashed to pieces on the rocks beneath. The barbarian Celts had a heaven for their gods and heroes, but the spirits of inferior men were localized in streams, trees, groves, and caves. Pagan Rome had Olympus for her gods, and Elysian fields for the common people who had lived justly. To these we may add :

4. Finally, all distinctions of souls founded on rank or ability are practically annulled. Heaven, ruled by one Supreme Person, but still peopled by a hierarchy conceived on the social and political orders familiar to pagan imperial Rome and early Christianity, is declared the common heritage for which all may strive.

What we have said so far concerning the doctrine of souls is only a part of the more comprehensive scheme of man's life here and destiny hereafter. There remains for consideration an equally large part of the sum of human belief relating to spirits independent of man, and, in primitive times at least, believed to be the unseen causes of natural phenomena. This part of the subject has been already incidentally referred to in the early part of this paper; now, however, it has claims to more particular attention, arising partly out of its own intrinsic interest, but chiefly because it presents the elements of all higher religious conceptions, and indicates the first gropings of the human mind after a Divine Providence. Long before the great historic religions were conceived about which so much information has been given us lately, ages anterior to the call of Abraham, to the dispersion of the Semitic, Aryan, or Turanian races, to the worship of *El*, or *Dyaus pitar*, or *Tien*, the early inhabitants of the world had a religion of spirits, relics of which survive to the present day. At least this is certain of the Turanian branch of the human family, and there is every probability that the same is equally true of the other two. All over the vast region of Northern and Central Asia this worship of spirits prevailed, at one time doubtless in its simplicity, though now in great part replaced by more elaborate religious institutions. Two at least of the great divisions of the human family, the Semitic and Aryan, have outgrown this primitive form of belief, but it still constitutes a great part of the religion of Turanian peoples, as Finns, Lapps, Samoieds, and even Chinese, and may be viewed in almost original purity among the Australian and Indian aborigines of the present day. Now, the key to this otherwise inexplicable religion is the animism on which we have all along been dilating. And the origin of animism itself is referable to primitive attempts at explaining the causes and meaning of

things. When primeval man saw or felt motion, heard sounds, smelt odors, he inferred life in the substances from which proceeded that which causes these phenomena of consciousness. Afterward life suggested spirit. A conclusion is soon arrived at that, as the soul is the cause of the phenomena of life in man, so a spirit is the cause of motion, sound, and odor, in the object-world. Every material thing, whether animate or inanimate, would at length be embraced in this belief, and stocks and stones would share religious honors with men and the moving individuals of flood and field. But religious belief is lifeless without action. From the time it assumes a distinct shape in the mind of man it is embodied in an outward form corresponding with its inward character, and hence the origin of worship. We might have illustrated this truth at some length under the preceding section, had space permitted, by reference to the practice of *manes*-worship so common as to be met with in nearly every part of the world. Here, however, we will regard it under the aspect of fetichism.

Fetichism is a branch of its parent-tree, animism. It is at once a theory and a practice, embodying both a primitive philosophy of causation and a more or less definite form of religious worship. In this double capacity, therefore, it has both a theoretical and a practical side. In so far as it is theoretical it may be viewed as an effort to explain the causes of phenomena on the supernatural hypothesis. "Some explanation of the phenomena of life," says Mr. J. F. McLennan, "a man *must* feign for himself; and, to judge from the universality of it, the simplest hypothesis, and the first to occur to men, seems to have been that natural phenomena are ascribable to the presence in animals, plants, and things, and in the forces of Nature, of such spirits prompting to action as men are conscious they themselves possess. So far as we know, this has been at some time or other the faith of all the races of men; and again, so far as we know, it is a faith that has nowhere been given up as unsatisfactory otherwise than gradually on its being perceived, from case to case, that the behavior of the forces of Nature and of the bodies they act upon is not

wayward or wilful, but conformable to law ; and until the law has been ascertained.”¹

We feel inclined to insist all the more on the practical or religious character of fetichism, inasmuch as an eminent authority on the subject, Sir J. Lubbock, has expressed it as his opinion that, because, for instance, “the negro believes that by means of the fetich he can control his deity,” it is essentially antireligious. It is just by his efforts to control the fetich in his own interest that the savage expresses his notions of religion. He believes that, by offerings, prayers, and supplications, he can induce his fetich to share his feelings, and further his schemes. This is, very likely, a perversion of religious practice to selfish ends, but yet it is far more excusable in him than in the Christian, and yet we do not commonly regard the repeated attempts of Christian communities to get God on opposite sides of a quarrel as antireligious.

Furthermore, on its practical side, fetichism is a means of arriving at a conception of the object of worship, for without some tolerably distinct image of such it could have no hold on the loyalty or affection of the human heart. As the late Mr. Mansell puts the idea, “Concepts, to be realized in consciousness, require to be individualized in an image. Without the application of this test we should not be able to distinguish between the conceivable and the inconceivable ;”² and, of course, we cannot worship what we cannot conceive. We see in the worship of fetiches, therefore, an effort, unaware of its philosophy likely, to realize in consciousness the concept of a spirit by individualizing it in an image. This latter would be at first some rude natural object, as a stick or a stone, but, with the progress of culture and æsthetic art, elaborated representations would be substituted, and at length, very much through the influence of these agents, fetichism would develop into anthropomorphism and idolatry. The practical aim of the fetich-worshipper is analogous to that which modern foresight seeks to effect through scientific knowledge and inventive skill. The disciple of Franklin erects a lightning-rod to

¹ The Worship of Animals and Plants. Fortnightly Review, October 1, 1869.

² Metaphysics, p. 36, American edition.

save his house and family from destruction by lightning. Similarly the savage endeavors through his fetich to control the forces of Nature in the interest of his own success and safety.

Our information regarding fetichism is still incomplete, owing partly to the difficulty of entering wholly into the spirit of so peculiar a custom, but chiefly to the unwillingness of savages to explain the nature of their faith and practices. Hence we may not know the precise character under which the fetich is at all times worshipped. On this point Mr. Tylor remarks: "As to the lower races, were evidence more plentiful as to the exact meaning they attach to objects which they treat with mysterious respect, it would very likely appear, more often and more certainly than it does now, that these objects seem to them connected with the action of spirits, so as to be, in the strict sense" (of the word fetich), "real fetiches." Some are doubtless worshipped as the embodiments of a spirit, and these are pure fetiches, but others may be regarded as in some mysterious way symbols or representatives of supernatural powers, and in this case they are evidences of a passage from fetichism into idolatry. But, furthermore, objects may be worshipped as fetiches because they, or their spirit, possess some exceptional quality which they can communicate to mortals. Without this latter information we would be at a loss to account for the reverence savages pay to ornaments and various objects, the very opposite to ornamental in civilized eyes, which they wear on the person. The Caribs treasured up the old bones of some of their dead, believing them to possess miraculous properties. Quartz and other minerals were objects of terror to the savage, because they held spirits able to inflict sickness and death.

To sum up what we have said on this part of the subject, fetichism may be regarded as having three stages of progress: In the first, objects are worshipped as having souls. In the earliest stage of religious belief every thing, whether animate or inanimate, has a soul. The friends of the dead warrior bury his bow and arrow with him, expecting that the souls of these implements will survive, and be useful to him in the pleasant hunting-grounds of the future life. One of the

oldest records we possess of this strange burial-custom is given by Herodotus where he describes how the Scythians, on the death of a king, slew fifty young men, and as many picked horses, stuffed the bodies of all, and then, setting the youths on horseback, stood the ghastly troop in a circle around the grave. We could not understand this cruel custom did we not know that it was merely a dutiful way of insuring to his royal highness a ghostly retinue in the world of spirits suited to his exalted rank.

In the second stage objects are worshipped as the embodiments of spirits and souls of men. "The Polynesians believed a bird conveyed to an object (a stone) the spirit which was for the time to reside in it. The Dakota Indians painted a stone, and worshipped it, appealing to it as grandfather, to deliver them from their danger."

The final stage of fetich-worship, or that in which it begins to lose its purely fetich character, and blends with idolatry, appears in the practice of paying adoration to material things as embodiments, however inadequate, of high spiritual powers. The outward transmission from one to the other of these grades is indeed, as Mr. Tylor says, scarcely perceptible, and, in the case of idolatry in particular, is chiefly marked by some artistic or ornamental addition to the image for the purpose of giving it an importance suitable to its new rank. The worship of idols is quite properly regarded as marking a stage of social development out of barbarism into civilized life. It does not indicate an abrupt change, but a gradual transition, nor does it stand out isolated from fetichism, its antecedent form of worship. On the contrary, between the two there is no sharp boundary-line, as indeed might be naturally inferred from the fact that both are children of animism, and bear in their features and history distinct marks of their parentage. Both are also endeavors at a realization of the animistic theory, at constituting it a form of religious worship. The object worshipped is not the inanimate block of wood or stone, but the soul which it is supposed to possess, or the spirit which it is believed to contain. There is not, so far as we know, an example in all the world of a people worshipping the material substance out of which the idol is made. And hence the

dangerous and insidious nature of the practice. It is the deadliest foe of all religions, no matter how pure and spiritual they may be. It crept into Buddhism, a religion uncompromisingly opposed to it, yet actually becoming idolatrous in practice from permitting representations of Guatama Buddha.

In its very early stage the idol is connected with *manes*-worship. It is regarded as the abode of the ancestral spirit and is fashioned after the form assumed by it in its apparitions. Subsequently it is regarded as embodying some one of the spirits animating Nature; and, finally, the term *idol* is used to denote images inhabited by a deity. The idol, however, is but one of the many places where the supernatural manifests itself. It is not supposed under the necessity of abiding here, but has its exits and entrances at its own pleasure. At particular seasons this entrance was solicited by the priest, but, though there is nothing to indicate that the image was actually worshipped in the intervals of these divine manifestations, it was at least regarded with awe and reverence.

The early Christians, who also had their share of animistic belief, though they could not disprove the miraculous facts recorded of idols, would only acknowledge them as the work of demons. In all ages the number of those is legion who appeal to one wonder in proof or explanation of another. The last resource is the first resort, it is always so ready at hand, and it is also so much less troublesome to cry "Miracle!" than to make a patient inquiry into natural causes, or to get a knowledge of the peculiar and interesting little tendencies in human nature to wilful courses of deceit. Our modern spiritualists do but perpetuate the belief of the infant state of the human race in ascribing to spirit agency phenomena which seem difficult of explanation on any known natural law. So-called spirit manifestations are as old as animistic religion, and are particularly familiar to those inveterate ancestor-worshippers, the Chinese. What is more, they are occasioning in our own day disputes in regard to their causes somewhat similar to those which raged in former times in reference to the nature of idol miracles. Now, as then, the spiritualists are divided into two hostile camps, namely, spiritualists in the narrow sense, who declare rappings, mysterious writings, and table-turnings, to

be the work of *manes* or departed human souls, and spiritualists in the broad sense of supernaturalists, who, believing in the intervention of spirits in worldly affairs, credit all such puerile doings to the devil himself or his busy servants. Outside this field of contention stand the perplexed philosophers, searching intently for some little talismanic stone, in the shape possibly of an old force rehabilitated in a new and high-sounding name, which they fondly hope will quash the dispute by bringing the disputants face to face with a scientific reason. But, with the unaccountable short-sightedness which sometimes characterizes learned though crotchety men, they are happily blind to the fact that their new theory of psychic force, like the old theories of magnetic force, od-force, and what not, explain nothing—are, in fact, in need of explanation themselves—and only make the existing confusion, which in all conscience is great enough already, “worse confounded.” Happily, it is no part of our task to suggest a “theory” of spirit manifestations, our whole duty in the premises being performed in pointing out the relationship they bear to their common parent, the rude animism of primitive man.

At a certain stage in the development of the supernatural we can perceive ideas of rank and order emerging from the uniform spiritual notions of primitive times, and can follow them as they shape themselves into a system of celestial government modelled after the observed subordination in Nature or after the political growth of society. We commence with the conception of a soul or spirit in individual objects, as an hypothesis necessary at the time to explain the causes of natural phenomena. Spirits caused movement, sound, light and darkness, death and sickness, good and evil fortune, pain and pleasure. They were invented to explain all the phenomena of life, they were in fact what constituted life, and, as they were also held to inhabit inert matter, it necessarily followed that every thing in nature was “instinct with life” to the primitive mind, i. e., had a soul. “As the human body was held to live and act by virtue of its own inhabiting spirit soul, so the operations of the world seemed to be carried on by the influence of other spirits. And thus animism, starting as a philosophy of human life, extended and expanded itself until it became a

philosophy of nature at large.”¹ Mr. Tylor’s work is full of examples showing the general prevalence, at some time or other, of this stage of belief, of its influence on the conduct and customs of savages, and also of its survival through all intervening forms of religion to the present day. It was plainly a philosophy of causation invented to explain individual phenomena at a time when the laws of Nature were, so far as man’s knowledge of them was concerned, in the womb of an immeasurably distant future. But, not to repeat what we have already said on this part of the subject, capable though it be of much further expansion, we must hasten to trace the progress of religious conceptions into higher forms of belief and worship, as also to indicate, so far as space will permit, such circumstances as the modes of thought and life which guided or accompanied the transition. These higher forms of religious belief and worship are polytheism and monotheism, and the circumstances now alluded to are such as are known to mark the progress of society from savage and barbarous to civilized life.

The point of transition from animism to polytheism is, of course, not easily traceable, but it may be roughly estimated to correspond with that period of the savage mind in which, outgrowing its first simple theories of Nature, it rises from particular facts to general laws and observations, here striking the path of inductive reasoning, afterward destined to lead to results of such importance to mankind. The first step would probably be, ceasing to regard objects in their exclusive character as units. For example, all trees of the forest having certain qualities in common would be grouped together as a species, and at the same time the individual spirits of each tree would be subordinated to one comprehensive spirit of the group.

As the appetite for generalization is encouraged, there would be a further attempt at classing together all trees of a given place—as, say, trees of the forest—under the animating influence of one forest deity. Further than this the savage is precluded from going, through his want of knowledge of other lands than his own. The same process of generalization was repeated with animals, for instance, each species of which was

¹ Tylor’s *Primitive Culture*, vol. ii., p. 169.

assigned its superintending spirit. The aborigines of North America and Australia believe in the existence of a common elder brother for each kind of animal, very large, very strong, and the archetype of its group. These considerations might well introduce us to the curious religious custom called *totemism*, had we either time or space to discuss it at present. Suffice it here to remark that they will not hunt or kill the animals of the kinds from which their *totems* are taken. Many amusing stories are told to illustrate the superstitious terror of the red men when, by accident, they have slain an animal of their totem kind. They have been known to humbly ask forgiveness of animals for having caused their death. "Beaver, my faith is lost; my totem is angry—I shall never be able to hunt any more," was the mournful salutation Mr. Long received from an Indian who had killed a bear. One thing, however, we must keep in mind while dwelling on this generalizing process. In all his reverence for the species deity, the savage never forgot the existence of the spirits and souls of particular objects. These were not supplanted. In time, indeed, belief in gods, who severally superintended the complicated operations of Nature, grew at the expense of primitive animism, and the local spirits sank to a subordinate position as servants of higher wills; still, they continued to form a large and by no means unimportant part of the religious assemblage of the period. The local spirits of fountains and rivers would be subordinated to a god of waters (perhaps of the sea), those of particular fires to one of fire in general, those of thunder and lightning to one of the sky, and so on in such other creations as gods of the homestead, of first-fruits, of love, and of marriage.

But, furthermore, some circumstance more or less peculiar to a country, as its geographical position, hygrometric condition, and climate in general, would serve to elevate one of these gods to a higher rank than all others in the minds of its inhabitants. Gradually all their hopes and fears would centre in this deity. His would be the greatest power, his works the mightiest works, his the most autocratic will of all the supernatural host. To him they would address their petitions in want and suffering, and him would they magnify above all

other gods. For example, the rain-god is most worshipped in the district of the Kol tribes of Bengal, where rain is unknown for long seasons, and much suffering prevails in consequence of famine and sickness. During this time of drought they address many petitions to this god, and toward its close they join in a pilgrimage to his holy shrine on the high hill *Marang Baru*. There, after uttering fervent prayers for saving rain, and depositing offerings of milk on the flat rock used for that purpose, they patiently await the appearance of the first cloud, and the rumblings of the distant thunder. Then, amid solemn strains of rejoicing, they return to their homes, well rewarded for their journey.

The effect of natural selection, if we may so call it, in giving predominance to a particular deity, is further illustrated in the special worship accorded to the water-god in certain localities. Continental savages, inhabiting inland tracts remote from great bodies of water, have no supreme deity of the watery element, though they have, as has been already observed, spirits of particular lakes, rivers, streams, and fountains. But islanders and dwellers on the sea-coasts have their great sea-god.

Now, what object in Nature is at once the most visible to man, the grandest in extent, the farthest away and yet the most familiar to his eye, the most varied, the most beautiful, next to his own body seemingly the most instinct with life? Is it not the heavens? And if, on contemplating the growth of a plant, the flow of a river, the poise of a rock, he hears a voice within him ask what makes the one grow, and the other flow, and the third stand balanced in its place, and he answers that these phenomena must be due to the presence of a living spirit in each object mentioned, how much more likely is he to have the same questionings as to what it is that makes the heavens so beautiful and so variable, at times so serenely blue, and again so thick and black, now bright with all the glowing colors of the spectrum, then cold like an arctic sea! Yes, truly, there is a Great Spirit in heaven, great as His abode is vast, exalted as His seat is high and mighty, for all the great features on Nature's canvas, the thunder and the lightning, the rain and the storm, the scorching heat and the stiffen-

ing cold, the hopeful dawn and the dewy eve, are His manifestations.

Belief in dualism can be traced back into savage life. It especially prevails among the Indians of North America. They hold that the world is ruled by two deities, one good, the other evil, both ever contending for the possession of men's souls here and hereafter. How much of this belief, in this mature shape, is the spontaneous growth of the uncivilized mind, or may have been imparted to it by Christian missionaries, is not always possible to say, and Mr. Tylor very properly cautions his readers against a too confident reception of such traditions as genuine and indigenous. But, with all due allowance for this possible source of error, it is still indisputable that primitive man had conceived and partly worked out the idea of a dualistic government of the world. The doctrine, indeed, would naturally spring out of primitive philosophy and experience. The philosophy of primitive man did not soar into high ethical regions. To him the good was no high ideal of attainment, but solely that which was pleasing to his senses or favorable to his interests. Similarly, he only knew that to be evil which pained his senses or hurt his worldly prospects. The former would come from a good spirit, and the latter from an evil. Subsequent realization of *moral* good and evil, and the problem of the origin of the latter, would both confirm for a time this early belief, and contribute to its diffusion. Subsequently moral good and evil would be regarded as of more moment than their physical analogues, whence it would follow that the sphere of action of good and evil spirits, removed from the material world—now surrendered to the undisputed sway of natural law—would be relegated to the moral world, where they still reign supreme. A remarkable myth, embodying the doctrine of dualism, and outlining its meaning, is given in Mr. Tylor's work.¹ It is the accepted myth of the Tuscarora Indians of North America, and runs as follows: A pregnant woman sank from the upper to the lower world. She alighted on a tortoise, having some earth on its back, and it grew into an island. The mother gave birth to twin-boys, and then died: They grew up, one becoming good

¹ Primitive Culture, vol. ii., p. 291.

(good spirit), the other bad (bad spirit). The good spirit wished to create light, but the evil one opposed him, wanting to keep the world in darkness. The good spirit prevailed, however. He made a sun out of his mother's head, and a moon out of a piece of her body. He made creeks, rivers, beasts, and fishes. But the bad spirit was always working against him, trying to do men harm.

The fear of evil being so much more keenly felt among mankind than the love of good, it is not so very surprising that the evil spirit should more than the good receive their homage and service, even to exacting the greater share of their prayers and sacrifices. Demon-worship reaches its culminating point, perhaps, in the religious system of the Izedis, or devil-worshippers of Mesopotamia, whose humble prayer is, "Will not Satan reward the poor Izedis, who alone have never spoken ill of him, and have suffered so much for him?"—an abject petition, truly, considering the object to which it is addressed; one expressing, more forcibly than any comments we might add, the absolute degradation to which a worship of fear is capable of sinking the human mind.

It is not our intention to claim for prehistoric man that he constructed out of his religious consciousness, or his needs and experiences, single or combined, a mental image of the Creator such as has been accorded to us by revelation. Such a task is, so far as we have any certain means of judging, unattainable by his unaided powers. Sages and poets, it is true, have seemed in moments of religious exaltation to touch the secret of the heavens, and what little they imparted to mankind of the mystery was joyfully welcomed, carefully preserved, and patiently meditated. But, notwithstanding what has been said to the contrary, we do not see grounds for believing that the masses could ever have attained to faith in the true God without a revelation. Into the profound question of this revelation, its how, its when, and its where, we do not propose to enter. Suffice it for this task if we have succeeded in showing how—

"through the ages an increasing purpose runs,
And the thoughts of men are widened by the process of the suns."

We may now briefly sum up the progress of the idea of a Supreme Deity. In all times man has diligently pursued the search for a cause. At first satisfied with accounting, however arbitrarily, for phenomena as they separately arose, he rested for a season ; but afterward observing that, instead of happening in a capricious and disconnected manner, they ranked themselves in a fixed and uniform order, he sought for the law or principle according to which this order was framed. Now, starting from the premises that single phenomena are occasioned by the presence of spirits, and reasoning out the solution of the wherefore of the more complex operations, he would arrive at the conclusion that they stood for coördinating powers who could be nothing less than greater spirits, of whose *dicta* the local spirits were the mere executors. Finally, observing the same order in the relations of the groups, he rose to the conception of a Supreme Spirit, who, through his deities of groups and his local spirits, guided the complicated operations of Nature.

The growth of the foregoing conception would bear relation to the development of the social and political orders. The earliest stage of primitive society, if it yet deserves such a name, as consisting of many loose, incoherent bodies of savages where personal freedom was paramount and political or social duties were unknown, would correspond with pure animism. The next stage of development into communities, having the individual subordinate in some respects to the society or tribe, would correspond roughly to the origin of polytheism ; and the final stage of savage, or it may be now barbarian life, in which several tribes, welded together in one body politic, acknowledged the supremacy of one chief, would see the origin of the idea of a Supreme Spirit.

The revelation of God to man has not supplanted the idea of a Supreme Spirit as thus developed, any more than the dissemination of religious truth has put to flight the hosts of demons, elves, and fairies, with which imagination has peopled the universe from the dawn of human reason. The two images live on side by side, blended so intimately in popular faith that they appear one in origin, in nature, and in their claims upon belief.

ART. V.—*Remarks on a Case of Reported Recovery from Glosso-labio-laryngeal Paralysis.* By T. M. B. CROSS, M. D., one of the Attending Physicians to the New York State Hospital for Diseases of the Nervous System, etc.

I DESIRE to call the attention of the profession to a case of glosso-labio-laryngeal paralysis, reported by Dr. William B. Cheadle, in the St. George's Hospital Reports, vol. v., and which he claims as an instance of recovery from that disease. Although this is by no means an affection of common occurrence, yet, since it was so graphically described by Duchenne, many cases have been studied in the most thorough manner, and in no single instance has there been a case of recovery published, excepting that of Dr. Cheadle. It is seldom seen by the physician in its earliest stages, and that may account somewhat for the little benefit which is derived from treatment, although, in an affection so grave, there is not much to be anticipated in the way of checking its onward course.

On carefully analyzing the history of Dr. Cheadle's patient, it seems to me that we are not justified in recording this as a case of glosso-labio-laryngeal paralysis, inasmuch as the data derived from the report will not warrant his conclusion. The doctor candidly admits that the condition of the hypoglossal, facial, and other cranial nerves, was not accurately ascertained; yet these are points of the utmost importance, for upon the proper interpretation of the phenomena resulting from the impairment of these nerves depends the diagnosis of the disease. At the present time there is a patient at the New York State Hospital for Diseases of the Nervous System, suffering from progressive muscular atrophy, which commenced in the tongue, and which, without the most careful study and examination, would readily be mistaken for a case of glosso-labio-laryngeal paralysis. In diseases of the nervous system there is no one symptom, generally speaking, by which we diagnose one affection from another; it is only by considering all the points in the case, and after we have duly weighed them, that we hope to arrive at a logical conclusion. In the present instance we will see how this has been accomplished. It is not my intention to enter fully into the symptomatology

of glosso-labio-laryngeal paralysis, but I will briefly give a few prominent points of this disease, in order to contrast the symptoms observed in the case under consideration with those of glosso-labio-laryngeal paralysis. The first evidence of the disease is either a slight embarrassment in the movements of the tongue, or a tendency of the lips to remain apart, or an impairment of sensation in the distribution of the trifacial, or a slight paralysis of the muscles of the lips. Gradually these troubles become more marked, and soon there is noticed slight difficulty in swallowing. Solids are more easily swallowed than liquids. The saliva soon begins to drop from the mouth, especially when the patient leans forward, and this flow is influenced by the degree of paralysis of the orbicularis oris. As the disease advances, the articulation of the linguals, which was at first very slightly impaired, becomes more and more affected; and finally, as the hypoglossal and facial are more completely involved, speech becomes lost, and the saliva flows from the open mouth in streams. Paresis which is due to exhaustion is among the later symptoms. Cough and suffocation are not present in the earliest stages. The mind is unaffected, especially at the commencement. No pain in the head is complained of. The food lodges at times between the teeth, and, as the disease progresses, other nerves become involved, the parts to which they are distributed become impaired, while their function is more or less modified. The affection is gradually progressive, so much so that it has been called by Duchenne "progressive muscular paralysis of the tongue, the veil of the palate, and the lips." The disease is more common in males than in females, and is rarely met with under forty years of age, while most of the cases reported are of a more advanced age. There is never a sudden accession of symptoms, but rather a slow, progressive increase which may or may not be marked by ameliorations; and at the beginning of the disease the symptoms are always slight in degree.

With these few prefatory remarks, let us examine the data in Dr. Cheadle's case, and compare them with those of genuine glosso-labio-laryngeal paralysis.

The first symptom of which his patient complained was frequent attacks of violent shooting pain in the head, accom-

panied with dimness of vision, which had already lasted several months, when suddenly one day, while sitting quietly in a chair, she became suddenly paralyzed on the right side of her body; her speech was totally lost. The hemiplegia involved the right side, namely, the face, the arm, and the leg. The arm and leg were utterly useless. There was no loss of consciousness, and at the end of a week motility was fully regained in the leg, although the arm remained weak for some time. For two days speech was almost entirely abolished, yet there was no amnesic aphasia, but only an inability to articulate. After the lapse of several weeks the paralysis of the face and of the arm had almost entirely disappeared, while her speech, however, still remained indistinct, thick, and nasal, and she was unable to protrude the tongue fully. Since the attack she has complained of severe shooting pain in the head, and of great drowsiness.

I think we are warranted, from the symptoms thus far, in diagnosing this as a case of embolism caused by the arrest of an embolus in the left middle cerebral artery, which has in its turn not only caused impairment of motion and sensation on the opposite side of the body, but has also given rise to ataxic aphasia, which at present at least appears to be the prominent symptom. I base this diagnosis on the following points: The attack came on suddenly, in a woman forty-two years of age, with no premonitory symptoms excepting frequent attacks of severe shooting pain in the head, accompanied with dimness of vision, to which she had been subject for several months. The lesion was on the left side of the brain, while the resultant paralysis was on the right side of the body. The leg fully regained its normal power at the end of a week, while several weeks after the attack the paralysis of the arm and face had almost entirely disappeared, yet her speech even now remained very much affected. There was no loss of consciousness. The pupils were natural. Now, this is neither the history of thrombosis nor of cerebral hæmorrhage, but rather that of embolism, and, if there had been a history of organic disease of the heart with or without a previous attack of acute articular rheumatism, the diagnosis would be much more complete. The mental symptoms, and the drowsiness,

which was especially marked when the patient assumed the upright position, and which manifested itself after this attack, I should attribute to the partial cerebral anæmia produced by the cutting off of the supply of blood to the brain, and the imperfect establishment of the collateral circulation. The increase in her difficulty of articulation, and in the weakness and numbness of her right arm, together with the vertigo, I should consider to be due to another attack of embolism, and this would reasonably account for the exacerbation of the symptoms. Up to this point in the history we have seen nothing that could not be easily interpreted. Now, she for the first time experienced great difficulty in swallowing; solids were more easily swallowed than liquids, the latter exciting great coughing, and were partly rejected through the nose. She complained of her food being tasteless and "sticking in the roof of her mouth," and of an increased flow of saliva. A rather sudden explosion of symptoms, but not to be wondered at when occurring in a highly-hysterical woman, as this patient appears to have been. At this period blisters were applied to the nape of the neck, and at the end of ten days decided improvement followed not only in her speech, but also in her swallowing. Three-grain doses of iodide of potassium were then given her three times a day, and in a fortnight her articulation and swallowing were so much improved that she was discharged, the act of swallowing at this time exciting no cough and no sensation of choking, although her articulation was slow and labored. A year afterward she had completely recovered, and had had no return whatever of her symptoms. Such is a brief *résumé* of the principal points in the latter part of the history, and, from what has already been said, it will not fail to strike the reader, who is at all conversant with the symptomatology of glosso-labio-laryngeal paralysis, that there is a want of similarity between this case and that for which it is mistaken. That the changes which occur in the motor cells of the medulla oblongata, and so gradually manifest themselves, could have so suddenly appeared and then disappeared is highly improbable, not to say impossible. The only disease, from which we could have possibly expected such a rapid amelioration of symptoms,

would have been syphilis, and even of this affection there was no positive evidence.

If this was a case of glosso-labio-laryngeal paralysis, I fail to see the evidence to establish that diagnosis. A much more plausible explanation of these transient phenomena, in my opinion, is to be found in the hysterical element which this woman seemed to possess in a marked degree, and which was no doubt still further influenced by the one or more attacks of embolism from which she had suffered, and which are so prone to leave behind them an undue exaltation of the emotions.

Such would be my interpretation of this case as it stands reported with its imperfect details, and, without further evidence to support it, I see no valid reason why it should be accepted as an instance of glosso-labio-laryngeal paralysis.

CONTEMPORARY LITERATURE.

REVIEWS.

Ray's Medical Jurisprudence.

It was not much to say of Dr. Ray's well-known treatise,¹ at the time of its first publication, thirty-three years ago, that it presented the most original and comprehensive work on the medical jurisprudence of insanity in the English language. Although the legal relations of the insane had always received more or less notice in works upon medical jurisprudence, no special treatise had been written upon the subject in Great Britain, except the pamphlet of Dr. Haslam, published in 1807, and none at all had appeared in this country. But of late such special treatises have multiplied, and that Dr. Ray's work still bears the palm, for the qualities which gave it preëminence at first, is no small praise. We believe, also, that it has greater weight as authority with the medical profession throughout the United States than any other treatise. Certainly it has, directly and indirectly, done more than all others to shape our laws, and the decisions of our courts, in regard to the insane. How well-grounded are its claims to be a stand-

¹ A Treatise on the Medical Jurisprudence of Insanity. By I. Ray, M. D. Fifth edition, with Additions. Boston: Little, Brown & Company, 1871.

ard of medico-legal doctrines, and how far its influence has been beneficial in determining the legal relations of insanity, are questions which cannot be fully discussed in this notice. It is well known, however, that the most marked features of the work are its protests against established doctrines of the English courts on the subject of insanity, and its advocacy of what are known as the moral-insanity doctrines. To these two points we shall confine our examination of a work which is too well known to call for a thorough analysis and review.

The first eighty pages are taken up with "preliminary views," in which the author introduces his favorite doctrines, in the form of a history and criticism of the English courts touching the question of insanity.

That many of the legal principles still recognized in the decisions of courts upon questions of insanity were laid down before any just and enlightened notions concerning the insane had become general, is matter of history. Nor can any medical man who has a practical knowledge of insanity fail to agree with the writer, that, from this cause, "error and injustice have been committed to an incalculable extent under the sacred name of law." We doubt, however, if the ignorance which permitted these evils was mainly owing, as he thinks, to the belief that mental disorders are the direct results of Divine power, and thus beyond the scope of human research. Notwithstanding the many absurd theories of this form of disease, which have sprung up from the most rude and empirical observation, and have followed every change in physiological doctrine, at no time since the days of Hippocrates has its nature as an affection of the brain been a matter of serious dispute. It was rather because the insane were put out of sight, and neglected by society, during the middle ages, that no progress was made in regard to the nature of their malady.

To Pinel and his disciples, then, is due not only the credit of having brought about a reform in the treatment of the insane, but also that of having laid the foundations of their legal rights and immunities. "Profound study and extensive observation of the moral and intellectual nature of man," in health and disease, have done something toward both these, but they must be regarded as chiefly the product of a more humane civilization.

Dr. Ray notices the divisions of insanity, and their definitions, in the Roman law and in the English common law of Lords Coke and Hale. He remarks, also, upon the great weight which is still given, especially in criminal cases, to the antiquated distinctions and maxims derived from these sources. "The first attempt," he continues, "to point out pre-

cisely those conditions of insanity in which the civil and criminal responsibilities are unequally affected, was made by Lord Hale." First, of the incapacity of infancy, to which Hale refers as a standard in the matter of insanity. A child under the age of fourteen is, *prima facie*, not to be held responsible for crime; "but, if he be above twelve years old, and it appear that he could discern between good and evil at the time of the offence, he may be convicted." And this knowledge of right and wrong does not refer to a moral sense, but to a consciousness that others regard the act as a crime, and that punishment will follow it. Even in a child, it is the fear of punishment which, if shown, warrants conviction. He next proceeds to treat of insanity, which is divided into congenital and acquired; or, in his language, into "born idiocy and *dementia accidentalis vel adventitia*." "The latter," he says, "proceeds from several causes: sometimes from the distemper of the humors of the body, as deep melancholy or choler; sometimes from disease, as fever or palsy; sometimes from a concussion or hurt of the brain." He then divides insanity into partial and total. The former exists where there is not a competent use of reason "on particular discourses, subjects, or applications," or where the insanity "is partial in respect of degree." Simple melancholy is a form of partial insanity, and this should not excuse from crime; for, he says, "doubtless most persons that are felons are under a degree of partial insanity when they commit these offences."

In the third edition of Dr. Ray's book, published in 1853, it is said that "the course of practice of the English criminal courts has been in strict conformity with the principles laid down by Hale." This was disputed by Mr. Wharton, in his monograph "On Mental Unsoundness," but was maintained by the writer in an unanswerable reply.¹ In the present edition, however, the sentence criticised has been changed to read: "Until quite recently, the course of practice in the English criminal courts has been in strict conformity to the principle laid down by Hale, that partial insanity is no excuse for the commission of illegal acts." Certainly there has not been a strict conformity to this principle in all the later English decisions, but we believe it still fairly represents the law of lunacy in England. In several important cases which have lately been published, this accordance with legal principles laid down two hundred years ago is complete. The writer goes on to show that, up to the beginning of the present century, at least, there had been no improvement whatever in English law upon this subject. The distinction made between civil and crimi-

¹ American Journal of Insanity, vol. xii., p. 285.

nal cases, in the greater severity with which the latter are judged, is justly commented upon. According to the law, a man may be so far insane that his property may be taken from him, and placed in the hands of trustees, yet he will be held responsible for criminal acts. "But it remains to be proved that, in the commission of a criminal offence, he has more clearly apprehended its abstract nature, its relations to the injured party, and its consequences to himself, than he would all the circumstances attending a contract; if, therefore, he have not acted rationally, but under the influence of a disordered mind, he ought to be no more responsible for the former than for the latter." An equally unjust and unreasonable difference is made between these two kinds of cases, in respect to the sources of proof. In civil cases, the act in question is sometimes admitted as conclusive proof of the mental state; whereas, to prove the existence of insanity from the character of the criminal act is quite inadmissible. "In still another respect is there a wide difference between civil and criminal cases. While the statute-book of England teems with enactments regulating the confinement and custody of the insane, and hedging them around with checks and safeguards, the relations of insanity to the criminal law have been left entirely to the discretion of the courts. An instance of unjust confinement is sufficient to arouse the whole community, and lead to prosecution and penalties of the severest kind; but, year after year, have persons of doubtful sanity ended their lives on the gibbet, without one voice being raised in reprobation of the barbarity." It is worthy of note how completely these differences are reversed in practice, at least in this country, at the present time. A degree of insanity which would ordinarily be more than sufficient to insure acquittal under a criminal prosecution, would not now be held to justify the friends of a lunatic in taking his property from him. We know, also, with what success Dr. Ray and other experts have maintained the plea of insanity in cases in which the criminal act alone afforded proof of the mental condition. There is no doubt, moreover, that the confinement of a sane person as insane is a species of injustice, against which there is little need to warn either courts or the public.

Passing from common to statute law, the French penal code is examined. Its phrasology is: "There is no crime nor offence when the accused was in a state of insanity at the time of the act." This is substantially the language of the revised statutes of our own State, which was copied from the code of Livingston. The intent of those who framed it was, no doubt, to leave the court and jury to draw the

line between partial and general insanity, from the facts in each case. "Though not prepared to acquiesce entirely in the dispositions of this enactment, yet it is infinitely preferable," the author thinks, to the English practice, of leaving it to a jury to sit in judgment on a man's understanding, and decide whether or not he had enough of reason left to discern the nature of the act committed. In justifying this view, Dr. Ray approves, also, the principle of the first marked change in the English criminal law of insanity. "True, mental unsoundness is not necessarily incompatible with crime, for we can conceive of cases where the criminal act is beyond the sphere of the influence of the reigning delusion, and therefore, as far as that is concerned, the offspring of a sound mind; yet we must acknowledge the extreme difficulty of establishing this fact, and the caution with which we should proceed to a decision."

The change referred to was wrought in the celebrated Hadfield case, in the year 1800, and consisted in making delusion of which the criminal act is the offspring the true characteristic of that kind of insanity which exempts from punishment. "But, though a fatal blow was given to the doctrine that such insanity only as is attended by total deprivation of memory and understanding can be admitted in excuse for crime," the victory gained was not final and complete. In the case of Bellingham (1812), and in that of Offord (1831), other tests were propounded, and a strong disposition to return to the principles of Lord Hale was manifested. These tests Dr. Ray takes occasion to examine critically and at length, with what keenness, and, generally, with what fairness and soundness of judgment, is probably known to most of our readers. It seems to us, indeed, impossible for one, who has any practical knowledge of the insane, to doubt that the ability to distinguish between right and wrong in reference to real or hypothetical acts is unimpaired in many cases in which the moral freedom is destroyed. But those who hold to the doctrine of Lord Hale deny that an incapacity to distinguish between moral qualities can be known, except through a loss of the mental integrity. They hold that insanity, in the proper legal sense, is a question not of moral capacity—for the determination of this must be extremely difficult, and its distinction from the moral insensibility of criminals impossible—but one of mental capacity. Now, for ourselves, we willingly admit that the insanity which should excuse from crime must be shown by evidences of a want of reason and understanding, and not of a want of moral sense only. The question to be decided is, that of the practical justice of judicial decisions based upon the narrow and rigid prin-

ciples laid down by Hale. And here we quite agree with Dr. Ray. On the strict application of these principles many persons have doubtless suffered the extreme penalty of the law, who ought to have been acquitted. Yet they were laid down without softening or qualification by no less an authority than Lord Mansfield, in the Bellingham case, and were formally approved by Lord Lyndhurst, in the case of Offord. In the latter case, however, they were in fact departed from when the jury were directed to acquit the prisoner if they were satisfied "that he did not know, when he committed the act, what the effect of it; if fatal, would be with reference to the crime of murder." That is, they were not only to consider whether he had sufficient understanding to know that the act was unlawful and punishable, but also whether he had an appreciation of the crime of murder. The change was in adding this latter element, so as to make the soundness of the moral sense a part of the test. Such, at least, is our understanding of it, and in this meaning it has been criticised by those who hold to the strict doctrines of Hale. Dr. Ray seems to suppose that the change was in confining the application of the test of right and wrong to the moment when the alleged criminal act was committed. But he is clearly mistaken here. This nice discrimination in favor of the prisoner is of much more recent origin.

"Another fact," says the writer, "which has been greatly relied on as a criterion in doubtful cases, is the design or contrivance that has been manifested in the commission of the criminal act." This test has been so thoroughly proved to be fallacious that it is now seldom referred to. The cunning and sagacity of many of the insane are so well known at the present time, that it is not easy to understand the ignorance which regarded these qualities as proof of sanity.

In his comments upon the soundness of the test of delusion as a test of responsibility, the writer for the first time distinctly touches upon those theories of mind which enter into, and more or less vitiate, all his writings. That so bold and vigorous a thinker, so forcible a writer, and so earnest a student of mental disorders as Dr. Ray, should have begun his career at the time when phrenology was holding its brief reign over scientific thought, has indeed been a serious misfortune to mental and legal medicine in this country. The theories referred to have been so thoroughly discredited by the advance of science, that their professed adoption as the basis of a work would be of itself enough to condemn it. And yet to Gall, besides the demonstration of the fibres of the white substance of the brain, and thus the adaptedness of that organ for its functions, belongs the credit of hav-

ing given an impetus to the study of mind from the side of organization which has done much to develop the science of psychology. His great error was, that, not content with laying and strengthening the foundations of such a science, he endeavored to constitute it at once, by joining certain faculties derived from metaphysics to corresponding organs having an imaginary existence in the brain. Now, that, in a subjective analysis, the mental phenomena are capable of certain divisions, as those of thought, feeling, and will, is freely admitted. It is universally agreed, however, among both metaphysicians and scientific inquirers, that it is practically impossible to draw any definite line between these divisions. Sir William Hamilton says: "It is not to be supposed that these phenomena" (thought, feeling, and volition) "are possible independently of each other. In our philosophical systems they may stand separated from each other, in books and chapters; in Nature they are ever interwoven. In every, the simplest, modification of mind, knowledge, feeling, and desire or will, go to constitute the mental state; and it is only by a scientific abstraction that we are able to analyze the state into elements, which are never really existent but in mutual combination." We hardly need say that Spencer, Bain, and all the scientific psychologists, find emotion undecomposably combined with knowledge in every mental manifestation. If, indeed, the doctrine of the evolution of mind from the simplest form of nervous action up to the highest intelligence, through a gradually increasing complexity and specialty, be true, there must be an insensible shading-off of these divisions into each other, so that a line of demarkation between them is impossible. That the cerebrum is a single organ, and not a congeries of organs, is, moreover, an indisputable fact of anatomy and physiology. Let us look, then, at the objections derived by Dr. Ray from the doctrines of phrenology to delusion as a test of insanity. "Now, if it were a fact that the pure reason, or, to speak more definitely, the intellectual powers, are exclusively liable to derangement, this test would be unobjectionable, and would furnish an easy and satisfactory clew to the elucidation of doubtful cases. But it must not be forgotten that the Author of our being has also endowed us with certain moral faculties, comprising the various sentiments, propensities, and affections, which, like the intellect, being connected with the brain, are necessarily affected by pathological actions in that organism." The implication here is—and the theory is more explicitly stated further on in the paragraph—that the intellectual and moral faculties are liable to be deranged separately, and that, in a case of

¹ Lectures on Metaphysics, vol. i., p. 188.

moral insanity, the test of delusion would, therefore, not be applicable. We answer that, as every mental change in health is made up of both thought and feeling inseparably combined, so in disease there can be no disorder of one of these independent of the other. "The truth is," says the writer in the next paragraph to the above, "there is no single character which is not equally liable to objection. Insanity is a disease, and, as is the case with all other diseases, the fact of its existence is never established by a single diagnostic symptom, but by the whole body of symptoms, no particular one of which is present in every case." But we do not claim that insanity is ever constituted by delusion solely, any more than we admit it to consist, in any case, of moral disorder alone. All we demand is, that insanity shall not be predicated of certain cases in which disorder of the passions or appetites is a marked symptom, unless disorder of the intelligence is also found. Let us here notice a source of confusion in the language of Dr. Ray, which is of some importance. It is his use of the word insanity to signify both "a disease," as above, and "a deprivation of moral liberty," as on another page. There is authority, doubtless, for whichever of these meanings he might choose to adopt, but to employ the word in both, and to shift from one to the other in reasoning, is clearly inadmissible. Yet a *circulus in probando* of this kind appears on many pages of the book. It is perhaps unfortunate that insanity should have been adopted into medicine as a general term for the whole series of mental diseases. It but vaguely describes those widely different degrees of disorder in the cerebral functions which claim the attention of the physician, while its meaning in legal and in common language is practically most important, and must always be the prevailing one.

Another part of the preliminary views is devoted to showing that "the law of insanity in Great Britain, especially that relating to criminal cases, is still loose and vacillating, and greatly behind the present state of our knowledge of that disease." For this purpose the celebrated answers of the law judges of the House of Lords are critically examined. "Notwithstanding the occasional instances of amelioration in the English law," Dr. Ray concludes, "the old principle, that some insane men are proper objects of punishment, is as binding at this moment as it was in the time of Lord Hale." And yet he has himself admitted, in a paragraph already quoted, that "mental unsoundness is not necessarily incompatible with crime." What, then, is the point at which his always severe, and sometimes unfair, criticism of legal doctrines is aimed? We do not doubt that, for the sake of

an appearance of logical perfectness, the legal tests of insanity are too rigidly drawn, and that, from a want of knowledge of mental disorders, they have often been most improperly applied by courts. But the writer goes far beyond this. He broadly denies that these tests can be safely applied, upon grounds which would render impossible any legal rules whatever upon the subject. "It has been shown," he says, "that these criteria are insufficient for the purpose, *because they do not cover the whole ground*, and are at the best but a begging of the question. For, admitting that the person knows he was doing wrong and contrary to the law, *it remains to be proved that this knowledge embraces all the elements of responsibility.*" Upon that part of the above which we have italicised rests the principal argument of these preliminary views. Its purpose is to prove the folly and inhumanity of legal doctrines which do not recognize a moral insanity.

In a brief review of the decisions of American courts in cases of insanity, their doctrines are found more loose, vague, and contradictory, even than those of the English law. As these decisions have certainly been, upon the whole, far more favorable than in the English courts—owing, we believe, in great part to Dr. Ray's writings and opinions—perhaps the fact should have been more distinctly recognized. This part concludes with the mention of "a notable departure from the ordinary modes of treating the question of insanity," by two judges of the Supreme Court of New Hampshire. The departure referred to is simply an application of the principles already mentioned as embodied in the Revised Statutes of this State. It throws aside all the tests of insanity which are found in the common law, and makes all symptoms and all tests of mental disease purely matters of fact, to be determined by the jury. Whether there is a moral insanity, and whether the accused is the subject of it; whether there are insane impulses, and whether every such impulse is irresistible; whether an act is due to partial insanity when no connection can be discovered between it and the disease—all these are likewise questions of fact, and not of law or science. Finally, "the defendant is to be acquitted on the ground of insanity, unless the jury are satisfied, beyond a reasonable doubt, that the killing was not produced by mental disease." To such a radical change in the legal doctrines of insanity, Dr. Ray thinks, "it would be difficult to offer a satisfactory objection." We admit that it would bring a certain sense of relief to every one who has endeavored to find out the law of insanity in this country, from the mass of unintelligible and contradictory opinions. Who does not see, however, that this would be the giving up of a problem

rather than its solution? It would, practically, leave the jury, in the most difficult class of criminal cases, to the instincts of natural justice, embarrassed by such theories of insanity as the conflicting counsel and experts might offer them. But we quite agree with the writer that some change is imperatively called for, and in the direction to which he points. "The frequency with which insanity is pleaded in defence of crime, the magnitude of its consequences to the parties concerned, and the perplexity in which the discussions it occasions involve the minds of judges and jurors, are ample reasons why the law relative to insanity should be simple and easily understood—a result that can only be obtained by direct legislative enactments."

In the chapter on "Mental Diseases in General," the writer assumes at the outset that "correct ideas of the pathology of insanity are not unessential to the progress of enlightened views respecting its legal relations." No medical man, we are sure, will maintain that the truth is too strongly asserted in this statement. But what are the conceptions of mental pathology which are "not unessential" to a proper medico-legal knowledge of insanity? Dr. Ray first mentions that which ranks mental disorder among natural phenomena, and regards it as due to the operation of natural laws. This is in opposition to the view of it as an affection of the soul, through a mysterious visitation of Deity. It is possible, as he supposes, that "much of the error and absurdity which have pervaded the law of insanity" originated in such a view; but for a century, at least, this cause can have had no weight, and need not now be considered. Another necessary conception he considers to be that of physical changes in the brain with which the mental disorder is connected. "This, the dissections of many eminent observers, among whom it is enough to mention the names of Greding, Gall, and Spurzheim, Calmeil, Foville, Falret, Bayle, Esquirol, Georget, and Parchappe, have placed beyond a doubt." When this sentence was written, more than thirty years since, the hope of connecting mental disorder with facts in the morbid anatomy of the brain was confidently entertained. Now, however, an increased experience and wider theories have left little place for it in the minds of scientific inquirers. Observation proves that physical lesions of the brain are by no means always present in mental disorders, and, on the other hand, that the gravest and most various injuries of the brain may exist without mental disease; and these facts find their explanation in our latest pathological theories. That function of the brain which we term mental is something far different, of course, from those processes of nutrition which are obviously related

with softening, hæmorrhage, etc. We have no right, then, to expect to find physical changes in disorders of a function whose relation to such changes we are wholly ignorant of. That "deviations from healthy structure are generally presented in the brains of insane subjects" is certainly too broad an inference to base upon examinations, chiefly, of those of the insane whose death has been due to some form of organic disease of the brain. We have no positive grounds, certainly, for claiming insanity as any thing but a functional disorder. Dr. Ray admits that "the pathological changes are not sufficiently definite to admit of classification, or of practical application in the treatment of the various kinds of insanity." It is at least equally true that they are insufficient for the diagnosis of that mental disorder which relieves from responsibility to the law. Such a diagnosis, so far as it is positive, is always based upon the mental symptoms alone; and, in general, that which gives to mental changes their character as morbid symptoms is found almost entirely in themselves. In health these phenomena appear in a certain order, and in harmony with external motives and objects. Disorder and want of relation to external objects, more than their relation to other morbid symptoms, is that which marks them as disease.

Dr. Ray passes from the pathology to the classification of insanity; which, "though of secondary importance in regard to its medical treatment, will be of eminent service to the legal inquirer, by enlarging his notions of its phenomena, and enabling him to discriminate, where discrimination is necessary, to the attainment of important ends." He speaks, also, of "the deplorable consequences of knowing but one kind of insanity." It will be proper to dwell for a moment upon this part of our subject.

It is well known that the celebrated Greek and Roman physicians considered chronic mental disorder as one affection, of which mania and melancholia were different degrees or varieties only. The former included all cases of general and complete mental disorder; the latter those in which disorder did not appear in all the manifestations. These were the divisions adopted by Hale in the legal doctrines already noticed. They were also adopted by Pinel, who, however, narrowed the definition of melancholia by making "delirium upon one subject exclusively" its chief characteristic. According to Dr. Tuke,¹ Pinel still further limited the term melancholia to cases in which the feelings are gloomy and depressed. But this is plainly a mistake. It was left for Esquirol to take this step, and to give to cases of partial disorder of

¹ Manual of Psychological Medicine, p. 93.

the understanding with joyous and expansive feelings, which had also been comprised under melancholia, the name of monomania. Signs of the confusion which the choice of this word has wrought in psychological medicine soon began to appear. It was defined by Esquirol as comprising one *or a limited number* of delusions; but, as its etymology pointed to cases of a single delusion only, this meaning was very generally attached to it. To the great majority of psychologists, however, such cases are unknown. Again, the term has been applied to a species of insanity in which no delusion whatever is present. Thus, the reasoning mania, or mania without delirium, of Pinel, was afterward termed instinctive monomania by Esquirol. Monomanias without end have also been named from the tendency of cases to certain acts, as homicide, suicide, arson; or from the prominence of particular passions, as pride, vanity, and falsehood. In all these, moreover, lesions of the intelligence may or may not be present. Yet the writer believes it "enough barely to mention," in favor of the facts of phrenology as against the speculations of metaphysics, "that the existence of monomania as a distinct form of mental derangement was denied, and declared to be a fiction of medical men, long after it had taken its place among the established truths of science."

Dr. Ray's classification of mental diseases is, as he says, that of Esquirol, slightly modified, and if based upon a sound psychology would, perhaps, be all that could be desired for forensic purposes. It contrasts mania with dementia, as grand divisions, and divides the former into intellectual and affective, each of which is again divided into general and partial. The writer approves these divisions as "made by nature," which can only be true if the term nature is extended to embrace the sphere of subjective psychology. Yet we can practically separate between cases in which disorder appears chiefly in the understanding, and those in which it is most strongly manifested in the feelings. Perhaps, also, the division of each of these classes into general and partial might be advantageously made in legal medicine, especially if it were understood that the finding of a partial mania did not carry with it the judgment of the physician in respect to a complete loss of moral ability. But here, in our opinion, the subdivision of mental disorders, with a view to medico-legal inquiries, should cease. We will not deny that a more extended classification may be necessary for the minute analysis of mental phenomena required in psychology and mental pathology, but inquiries which centre in the question of the loss of the free-will have the character of a synthesis, and the divisions adopted should be the most general and flexible, so that all the important symptoms in a particular case may be embraced in them.

In treating of the pathology and symptoms of mania, the writer urges the importance of recognizing mania as a disease of the brain, as he had before done in respect to insanity in general. To the reader of to-day it seems strange that so much stress is laid upon a point which no one now thinks of disputing. But the argument is good as against his own inferences from "the dissections of many eminent observers" already noticed. Moreover, not a few medical writers, at this time, appear to consider a disease which is not founded in morbid anatomy as little better than fictitious. He says: "It will scarcely be contended, at the present day at least, that the structural changes found after death from any disease are the primary cause of the disturbances manifested by symptoms during life, or that, if the interior could be inspected at the beginning of the disease, any of these structural changes would be discovered. It is now a well-recognized principle that such changes must be preceded by some change in the vital actions of the part where they occur." In fact, nearly the whole of this chapter is as valuable as when first written, and several new sections, devoted chiefly to a discussion of the insane temperament, make it as complete as could well be desired. Yet we must take exception to that part of the closing paragraph in which the reasons are given for dividing mania into intellectual and affective. It need hardly be said that all modern psychologists, including those who most strongly insist upon the study of mental phenomena by the methods of physical science, agree in yielding the necessity of assuming an unknown something beneath these phenomena, which may be termed the mind. Of this mysterious essence the outward manifestations alone are known to us, and these we separate, by an analysis, into thoughts, feelings, and volitions. The error of Dr. Ray is in supposing that an unknown essence, which he terms a faculty or power, is represented in each of these, and an indefinite number of other, forms of mental changes. In fact, he makes the mind, which every current system of philosophy agrees in considering a unit, a congeries of independent faculties, just as he supposes the brain a congeries of separate organs to match. We must insist that there is just as little warrant for the psychological hypothesis as for the physiological. Let us note, once more, these fundamental errors. Thought, feeling, etc., are properly divisions of the mental phenomena only. Dr. Ray treats of them as independent powers underlying these phenomena. Mental diseases he considers as affections of these special powers, and declares that "unless we study them separately, and recognize their independent existence—and this it is the effect of the above classification to produce—we shall never be able to

refer them to their true source, nor discover their respective influence over the mental manifestations."

In the chapter on general intellectual mania, we are warned not to suppose that in this form the derangement is confined to the intellectual faculties, the moral continuing to be exercised with their ordinary soundness. On the contrary, the moral faculties seldom escape its influence; and one of the earliest symptoms of the disease is an unaccountable change in the patient's social and domestic feelings. We would add that this change in the feelings marks the earliest stage of mental disorder in nearly all its forms. This fact seems to have been known to the ancient physicians, and, with others gathered by those acute observers, gave them the conception of insanity as a single disease.

The chapter on partial intellectual mania begins with the statement that "by the ancients this form of the disease was called melancholia, on the supposition that it was always attended by dejection of mind and gloomy ideas. This term was used and so understood by modern writers, till Esquirol proved its improper application by showing that the ideas are not always gloomy, but frequently of a gay and cheerful nature. He substituted the term monomania, which is now in general use." There are several errors in this passage which we wish to correct, although it may be necessary to repeat something that has already been said. Partial insanity was termed melancholia, from an imaginary principle in the body, which, by its excess, inflamed the passions of jealousy, hatred, revenge, and the like. These, and not gloomy feelings and ideas, were, it seems, considered most characteristic of melancholia, under which term cases of light and cheerful feelings were also included. This is the sense, moreover, in which it was used by Pinel, who pointed out that two opposite types of cases presented themselves under the division. Esquirol was the first to act upon this hint, by separating melancholia into two divisions, in one of which the cases marked by mental depression were left under the old name, and in the other those in which the feelings are gay and expansive were placed, under the name of monomania. Dr. Ray's classification formally does away with both these divisions, and distributes the cases into three new ones, viz., partial intellectual mania, and general and partial moral mania. Still, "for convenience' sake," as he says, the term monomania is used in treating of both these partial manias, "with the understanding that it always refers to that form of insanity which is the immediate subject of discussion." Are there not sufficient reasons in its history, and in the vague and shifting sense in which it

is used by Dr. Ray, for doubting "the existence of monomania as a distinct form of mental derangement?"

We come now to the consideration of moral insanity. "Thus far mania has been considered as affecting the intellectual faculties only; but a more serious error on this subject can scarcely be committed than that of limiting its influence to them." This statement will not bear a close examination. In the first place, no psychological doctrine except that which the writer professes, will admit the hypothesis of mania "as affecting the intellectual faculties only." The danger of any serious error of this sort is wholly confined to the phrenologists. Again, Dr. Ray is incorrect in saying that he has thus far considered mania in this view alone. In his description of mania in general, disorder of the feelings is properly set down as the earliest symptom, and as its most marked characteristic throughout. He also says of general intellectual mania: "The general description of mania is equally applicable to the acute state of this and sometimes of other forms of the disease. It is not, generally, till after the excitement has somewhat subsided that the distinctive features of each become very manifest." The last sentence ought more clearly to state that general intellectual mania is nothing more than the chronic stage of a few cases of acute mania.

The next step in the introductory argument for moral insanity repeats certain fallacies already pointed out. "It will not be denied that the propensities and sentiments are also integral portions of our mental constitution; and no enlightened physiologist can doubt that their manifestations are dependent on the cerebral organism. Here, then, we have the only essential conditions of insanity—a material structure connected with mental manifestations; and, until it is satisfactorily proved that this structure enjoys a perfect immunity from morbid action, we are bound to believe that it is liable to disease, and, consequently, that the *affective* as well as *intellectual* faculties are subject to derangement." Here distinct moral powers, termed the propensities and sentiments, are supposed. Next, a material structure devoted to these powers, and on which their manifestations are dependent, is tacitly assumed. To argue, then, from powers to structure, and back again, is very easy but is hardly conclusive. If the disbelievers in moral insanity, who are required to prove that a purely imaginary organ, or class of organs, devoted to the affective faculties, "enjoys a perfect immunity from morbid action," should resort to a similar style of argument, we can imagine the kind of criticism it would receive from Dr. Ray. And yet, the doctrine of moral insanity is rested en-

tirely upon this argument, and not on the question whether cases of insanity really occur in which disorder of the sentiments or passions alone is found. "Whether there may or may not be some small degree of intellectual disturbance in the class of cases referred to, is a question which, practically, is of trivial importance. The main truth will scarcely be denied, that the disturbance of the moral or affective powers is obvious and extensive, while that of the intellect is very slight at the most. The essential question is not whether the intellect is impaired, but whether the affective powers are so deranged as to overpower any resistance made by the intellect. It is a matter of relative power, and hence it is quite immaterial whether the result proceeds from impaired intellect or irresistible activity of the affective powers." Now, we know nothing at all of any affective powers which can overpower, or of any intellect which can make, a resistance. These struggling spiritual essences are, of course, wholly unknown to science, and they have no place in any modern system of metaphysics. Moreover, it is one thing to base a diagnosis of insanity upon impaired intellect, and quite another to make it the result of an activity of the affective powers described as "irresistible," by which the question of insanity is simply taken for granted.

The writer's history of moral insanity is wanting in accuracy, and apparently in candor also. An insanity without delirium or notable disorder of the understanding was first described by Pinel. "I was not a little surprised," he says,¹ "to find many among the insane who at no time gave evidence of any lesion of the understanding, but were under the dominion of instinctive and abstract fury, as if the active faculties alone were impaired." Dr. Ray, however, translates "affective" instead of "active" faculties in this quotation, and in this way makes Pinel the author of moral insanity. Now, Pinel had no conception of the disease afterward set up by Prichard under this name, and the cases which he gives to illustrate his reasoning mania are far from coming under the definition of it. It is curious, too, that Prichard made the mistake, as he afterward acknowledged, of borrowing these cases of Pinel to illustrate his moral insanity. All this may be taken as showing how far this disease was an invention rather than a discovery. Be this as it may, however, at the date of the earlier editions of Dr. Ray's book, twenty years and more ago, it was true, as stated, that "the reality and importance of this distinction, which thus establishes two classes of mania, are now generally acknowledged by practical observers." But an addition to the above appears in the

¹ *Traité Médico-Philosophique sur l'Aliénation Mentale*, p. 155.

present book, in which we must mark a departure from the truth of current history on this point. Dr. Ray wishes, naturally, to believe that the doctrines of moral insanity are still accepted by a considerable number of the profession, and quotes as favorable to them the names of several eminent members of the Société Médico-Psychologique of Paris, who took part in the well-known discussions upon this subject, in the years 1866-'68. Now, the fact is, that these doctrines were substantially repudiated by nearly all the members of this society, as they have also been by most German psychologists. Of the theory of monomania, which forms a part of them, Griesinger¹ says: "Originally established by Esquirol, and always of more importance forensically than pathologically, this doctrine, even in the land of its birth, has fallen into a state of complete neglect. Scarcely any French psychologist now maintains it in its complete, original sense."

To see, indeed, that moral insanity, as it appears in the cases brought to exemplify it, is an artificial combination of dissimilar facts, and not a true form of mental disease, little more is necessary than to read the section which Dr. Ray has devoted to this subject. In the first cases, we find a general excitement and exaltation of the feelings which we cannot fail to recognize also in the intellect, although it falls short of delirium or positive delusion. We remember, too, that these are the symptoms which usually mark the first stage of acute mania. The second cases are characterized by periods of alternate excitement and depression, between which is sometimes an interval of apparent mental health. These are now well known under the name of *folie circulaire*, or alternating insanity. The third cases are those in which all moral distinctions are lost sight of, and "vice is substituted for virtue, evil for good, and every elevated sentiment having reference to the good of others is replaced by a perpetual love of mischief." The question whether or not these are cases of insanity is often an extremely difficult one, but certainly to suppose a form of disease which will cover them is not to furnish an answer. The last species of moral insanity described is that now known as simple melancholia. In a strictly medical sense, this division is of more importance than all the others; but melancholia does not necessarily excuse from responsibility for crime.

We have little to say, in conclusion, of the various monomanias which Dr. Ray describes under the head of partial moral mania. If a class of faculties may be separately diseased, as in moral insanity, it is easy to believe that disease may be confined to a single faculty.

¹ Mental Pathology and Therapeutics, p. 74, second edition.

This inference has, however, proved the *reductio ad absurdum* of the whole doctrine of moral insanity. The number of faculties which may be imagined is, of course, practically unlimited, and no form of vice or crime can fail to cover itself with the shield of irresponsibility under such a scheme. Dr. Ray recognizes manias of theft, falsehood, venery, incendiarism, and murder, and his detail of illustrative cases is long and elaborate. We are far from denying that most of these may be cases of true insanity, though the tendency of their classification is plainly to identify insanity with crime, and not to separate between them. But it seems now to be generally admitted that this scheme is unsound in principle as it is unsafe in practice, and if it lingers in use it is only because nothing satisfactory has yet been offered in its place. Whether a classification can be devised which will combine the medical and medico-legal aspects of mental disease, or whether one strictly medical shall be adopted, leaving the question of a loss of moral liberty to be considered separately, is a point which we cannot at present discuss. At any rate, the work of Dr. Ray must always be of value, as combining the principal facts and arguments which have been made use of, with no trifling effect for two generations, in favor of a moral insanity.

Report of the English Board of Commissioners in Lunacy.

THE Board of Commissioners in Lunacy for England¹ and Wales consists of four lay, three medical, and three legal members, with a secretary; and the chairman is the well-known philanthropist, the Earl of Shaftesbury. One of the duties of the Board is to draw up an Annual Report, which is presented to the Lord Chancellor (the legal guardian of all lunatics), in which they describe the visits they have made to the asylums and private mad-houses throughout England, and indicate the conditions of management, and especially the shortcomings of each of them; and it is upon these shortcomings that we shall chiefly dwell, because it is not by any means improbable that they may be as prevalent on one side of the Atlantic as on the other.

The asylums, hospitals, and licensed houses for the reception of the insane in England and Wales are now 176 in number: namely, county and borough asylums, 50; registered hospitals, 16; state asylums, 4; metropolitan licensed houses, 41; and provincial licensed houses, 65.

¹ Twenty-fifth Report of the Commissioners in Lunacy to the Lord Chancellor. Ordered by the House of Commons to be printed, July 13, 1871.

The commissioners report, in relation to the county and borough asylums, that, on the whole, their condition may be considered as very satisfactory. In some instances, however (they add), there is still a deficiency in the number of medical officers, and the staff of attendants and nurses has been found inadequate, and their wages on too low a scale to secure and retain the services of thoroughly responsible persons.

"The rule which we have endeavored to enforce for the careful medical examination of the persons of the patients immediately on their admission, and before those bringing them to the asylum are permitted to leave, has been more generally adopted. The result has been, the frequent discovery of marks indicating ill treatment and neglect previous to their reception, and six men were found to have fractured ribs, which, in three cases, proved fatal. In the case of a woman at the North Riding Asylum, the details of which will be shortly mentioned, where a fracture of the right arm and other marks of injury had been received, the poor woman had been intrusted to the care of the relieving officer, unaccompanied by any person of her own sex, and it seemed pretty clear that she was injured on the journey to the asylum, although on reaching it he was too drunk to give any account of what had passed; but in the fatal cases of fractured ribs, though inquests were held, and every inquiry was made by us with a view to the discovery of how the injuries had been inflicted, a satisfactory result has been extremely rare. There was always evidence that the patient had been exceedingly violent and dangerous, and with such cases in the hands of inexperienced persons it would, perhaps, be hopeless to expect that accidents should not occasionally occur; but the knowledge that injuries will infallibly be detected at the asylum, on the arrival of the patient, cannot fail to have a beneficial effect, and will, it is to be hoped, often insure more gentle treatment."

The overcrowding of many of the pauper asylums is also strongly protested against, and it is urged that in no case should a county or borough asylum be without an assistant medical officer. At present, the only county asylum without two resident medical officers is the Cambridgeshire one.

Attention is drawn to a case of suicide in the Carmarthen Asylum which strongly illustrates the necessity for constant vigilance on the part of attendants in charge of patients with suicidal tendencies, however great their apparent improvement may be :

"A woman, G. P., was received on the 19th of March, who had previously attempted suicide on several occasions. She was then

'melancholic, and depressed in manner,' and the head nurse received from the medical superintendent a written notice to this effect, she and all the other nurses being directed to give special attention to the case. She soon seemed to improve, and the attendants observed no desire to escape from observation, nor any suicidal tendency. On the 18th of May, however, two months after her admission, she succeeded in strangling herself, in a water-closet on an upper floor, with a piece of copper wire.

"The deceased was in a ward on the ground-floor, through which, on the day of her death, the patients belonging to the ward above passed on their way to the airing-court. It was the special duty of one of the nurses to watch the staircase-door, and see that none but the patients belonging to the upper ward passed through it; there was also a strict rule that the doors of the upper bedrooms should at all times be kept locked, but both these precautions were neglected. The deceased passed up-stairs unobserved with the other patients to the first floor, and, ascending to the upper story, succeeded in killing herself with a piece of copper wire, which she tore down in a water-closet. To their verdict of 'suicide by strangulation while in a state of insanity,' the jury appended a resolution expressing their opinion that greater care should have been exercised in watching the patient, and that sufficient attention had not been given to the strict enforcement of Rule 15 in the Regulations of the Asylum, as to the proper locking of the doors."

"Any infringement of this rule subjected the attendants to fine or dismissal; but all inquiries failed to show which of the nurses had thus neglected her duty. It was clear, however, that the negligence of the nurse who had watched the staircase-door had principally conducted to the suicide, and in a correspondence with the visitors we recommended that she should be dismissed. The committee, however, declined to comply with our suggestion—a decision, we think, much to be regretted, as it can hardly fail to relax the feeling of responsibility which should attach to all having charge of the insane."

In the Cheshire and Dorset Asylums they refer to preventible cases of suicide similar to the Carmarthen case. In the Dorset case, the patient, who was "strongly suicidal, with intense melancholy," was found suspended by the neck from a gas-burner in the bath-room, quite dead. Although at the inquest no blame was attached to any one, the commissioners consider the "precautions adopted in this asylum for securing the safety of suicidal patients were most lax and inadequate."

The following fatal incident in the Carmarthen Asylum indicates the danger of giving prolonged warm baths in cases where the state of the heart and lungs has not been ascertained, and where the administration is strongly resisted :

"H. G., a patient in this asylum, who had disease of the heart and lungs, which had not been detected by the medical officer, died under the following circumstances, viz. : A warm bath was ordered to allay the excitement of acute mania under which she was suffering. Though she resisted, and struggled with the nurses, she was kept in the bath for the space of ten minutes, and only taken out on their observing that she had turned pale. Brandy was given to her, but she died immediately."

A case of death from starvation in the Durham Asylum is recorded. J. W. was admitted on the 12th of November, and died on the 16th. In the notice of death the assigned cause was "starvation and typhoid pneumonia." On inquiry, it appeared that, for six days previous to her admission, she had refused food. It was a case peculiarly requiring early treatment in an asylum, and the commissioners, being of opinion that her life might have been saved, had more active steps for her removal been taken, addressed a letter to the Poor-Law Board in the hope that they would compel boards of Guardians to insist upon the *immediate* removal of lunatics to asylums.

They "have again to notice the cases of three male patients, who, during the past year, have died in the Hanwell Asylum with fractured ribs and marks of violence on their persons." In one case, that of George Scott, a restless, troublesome patient in the Refractory Ward, it was proved that he had been pushed against a door by another patient. A single attendant had charge of the whole ward, containing thirty refractory cases, and the commissioners strongly urged the appointment of an additional attendant in order to prevent the violence of patients. When another case, that of Joseph Oven, shortly afterward occurred in the same ward, the Hospital Committee acted on the advice previously given them. In consequence of this second case occurring within a few months of the former, public attention was unpleasantly directed to Hanwell, and two commissioners were appointed to examine into and report upon it. Their report extends over eight pages. It appears that Oven was suffering from mania, with general paralysis, on his admission, on the 23d of December. He was a troublesome patient, and was at once sent to the Refractory Ward. On the following day he had a fall in the bath-room. He remained in the ward for a fortnight, sleeping always in the padded room, in which there is no

bedstead. Nothing was noticed till the 7th of January, when the discovery of a bruise on his left side led to an examination, which resulted in the detection of two fractured ribs. Although due treatment was then employed, he gradually got worse, and died on the 20th. "As to the when, the how, or from whom, this unfortunate patient received the hurts of which he died, nothing (say the commissioners) more settled or conclusive can be determined than that he came into the asylum without any of his ribs broken; that most certainly no such fractures could have been occasioned by his fall in the bath-room the following day; and that he had remained as he was admitted till not more than two or three days before the existence of the injuries which caused his death were suspected or discovered. There are, however, other points and considerations of great importance connected with this case, and arising out of the evidence taken by us, as to which, in our judgment, no reasonable doubt can be entertained."

After passing a strong opinion on the conduct of one of the attendants who had failed in his duty in not at once reporting the bruise, and recommending his dismissal, they proceed as follows:

"We report finally our opinion that better arrangements generally are much needed in the male division at Hanwell for the proper care and protection of that class of patients to which Joseph Oven belonged, namely, those who are excited and troublesome, and yet feeble and paralytic. Such patients on admission ought not to be placed in a refractory ward, or associated with patients of violent or dangerous propensities, but in whom there is no marked bodily weakness. The class first named should always be placed in small wards on the ground-floor, with a so much larger than the ordinary proportionate staff of attendants as will admit of their receiving at all times the increased care and supervision which their habits and infirmities require."

Acting on this recommendation, the visitors dismissed the offending attendant, made improved regulations concerning the attendance on patients when bathing, and increased the staff of keepers in the Refractory Ward.

In the third case of fractured ribs—that of W. B.—death was found to be entirely due to accident, and not to any want of care on the part of the attendants.

There was a death from scalding at the Stafford Asylum, which, although considered to be entirely accidental by the coroner's jury who investigated the matter, must, in the opinion of the commissioners, in some measure be attributed to carelessness on the part of the nurses in charge, and they draw attention to the case as another of

those accidents which prove what strict precautions and care are necessary in all that relates to the administration of warm baths. The facts are shortly as follows: The patient, a woman named S. P., who was very feeble and paralyzed, having dirtied herself, was taken to a closet near the bath-room, and hot water was drawn into the bath for the purpose of cleansing her. The nurse then left the room, and in her absence the patient, with her clothes on, got into the bath, and was so scalded that, according to the medical evidence, the cuticle was destroyed nearly all over her body, and she died in about eight hours after the accident.

A case of fractured humerus, on admission into a Yorkshire asylum, calls for strong reprehension. It is the case referred to in an early part of this article, and the following details were elicited: A woman was brought to the asylum for the North Riding of Yorkshire, by the relieving-officer of the Northallerton Union, on the 1st of January, 1870. She was examined by the medical superintendent on admission, and the following report of her condition was forwarded to this office: "With respect to her mental state, she is laboring under melancholia, and with respect to her bodily health and condition she is extremely low, much bruised about the right shoulder, and the right humerus fractured high up. On admission was apparently dying."

It appeared that the woman had been trusted by the workhouse authorities to the sole care of the relieving-officer, and was unaccompanied by any person of her own sex. The grossness and impropriety of such a proceeding may be judged when it is stated that, on arriving at the asylum, he was so drunk that he could give no explanation whatever of what had occurred on the journey. Upon calling the attention of the Poor-law Board to this case, suggesting at the same time that a circular should be sent to every workhouse, forbidding the removal of insane women unaccompanied by a person of their own sex, they learned that an inquiry had already been made by one of their inspectors, the result being that the relieving-officer was dismissed, and that the Poor-law Board, considering that the case reflected great discredit upon all the officers concerned in the removal, had requested the guardians to censure the master of the workhouse and the medical officer.

Two members of the board, who visited the new asylum for the East Riding of Yorkshire, now in course of erection, have objected strongly to "the mode of fixing the gas-pipes, and to the description of fittings which it was intended to introduce, as offering the most obvious and dangerous facilities for suicide by suspension, and an entire rearrangement was recommended.

"In some of the single rooms large iron pipes for conveying the water from the roof were also fixed in such a manner as to be open to similar objections, and for these, if allowed to remain, secure wooden cases were suggested.

"No means had been adopted, by hydrants, or otherwise, to check the spread of fire.

"Some suggestions were made as to the mode of laying out and subdividing the airing-courts, and the necessity for immediately planting a belt of trees to the north of the asylum, which had been strongly recommended when the estate was purchased, was again urged upon the attention of the committee.

"The general arrangements of the building were considered to be satisfactory.

"It did not appear that any steps had been taken to provide furniture for the asylum, nor for the appointment of the medical superintendent. The commissioners were of opinion that the time had arrived for taking these matters into consideration, it being of the utmost importance that the committee should be advised by the future superintendent in carrying out the various details of furniture and fittings."

The preceding observations suffice to show the anxious care with which the Board of Commissioners discharge their duties to late, present, and future inmates of the asylums of which they have charge. The following extract will show that they do not neglect the interests of pathological anatomy :

"In our last report we drew special attention to the importance of making post-mortem examinations, as far as possible, in the cases of all insane patients dying in asylums and licensed houses. At the same time we expressed the opinion that such examinations should not be made contrary to the wish of the relatives of the patients, or without giving them an opportunity of objecting thereto. We desire again, for the reasons and objects then stated, strongly to repeat the opinion already expressed, that, subject to the consent referred to, post-mortem examinations should be made in all cases.

"We are glad to say that the records of the past year, as regards the public asylums, show that a larger proportion of post mortems to deaths have been made than in the preceding year.

"In 49 of these establishments there were, in 1869, 3,105 deaths, in which 1,065 examinations were made, being in the proportion of 34 per cent.

"In the same 49 asylums, in 1870, there were 3,110 deaths and 1,336 autopsies, or a proportion of 42 per cent.

"Great variety of practice, however, still exists. In the following nine asylums, namely, Carmarthen, Cumberland, Rainhill, Hanwell, Warwick, Worcester, the West Riding of York, and the City of London, we have the satisfaction of observing that post mortems are rarely or never omitted, and that, of the 650 deaths which took place in 1870, autopsies were made in 605 instances, a proportion of 91 per cent."

While in nine asylums post mortems are scarcely ever omitted, 605 autopsies having been made in 650 deaths, sixteen asylums (whose names I need not give) are named in which, with a total of 848 deaths, post-mortem examinations were made in only 65 cases; the percentages of autopsies thus ranging from 91 to 7.

The commissioners next direct attention to various populous boroughs, as for example Portsmouth and Southampton, in which there are still no asylums and no accommodation for pauper lunatics; after which they turn to *lunatic hospitals* as distinguished from asylums. In an appendix there are notices of visits made to fifteen of these hospitals, of which perhaps the best known are St. Luke's and Bethlehem, in London. In the body of their report they refer, however, only to the Lincoln Hospital. It came to the ears of that restless and somewhat troublesome member of the House of Commons, Mr. Whalley, that certain male patients had complained, after they left the hospital, of having been ill treated by the attendants. He induced the Secretary of State to institute an inquiry, and consequently two members of the board went to Lincoln to investigate the matter. It appeared that these charges, which were brought by two patients against three attendants, had been already investigated by the governors, who, while finding that the complaint was not fully proved, cautioned the attendants as to their future behavior, "so that there might be no pretext for future complaints." The alleged ill treatment consisted in the use of foul and violent language by the attendants, of threats, and of acts of violence, such as tripping up patients, kneeling on them, and striking them. The commissioners came to the conclusion that the allegations brought against the attendants were substantiated; but, doubting whether these acts of violence and ill treatment could be proved to the satisfaction of a jury, the board were reluctantly compelled to limit themselves to suggesting to the governors of the hospital that the three attendants referred to should be at once dismissed. This the committee so far concurred in as to give them notice to leave at the end of a month.

Any physician interested in the study of insanity and its treatment, who will take the trouble to wade through the appendices containing

the entries by commissioners at county and borough asylums, and at hospitals for the insane, will be well rewarded for his labor. He will see the good and the bad points of one system indicated with equal clearness, praise bestowed where it is deserved, and shortcomings exposed without mercy. Some of the most important of the latter are noticed in the body of the report, which occupies only about a quarter of the volume, or 91 out of 399 pages.

A good idea of the thorough nature of the supervision exercised by the board may be formed when I state that there are few asylums where some defect is not indicated, with the view of its removal. In a considerable number the bathing arrangements, according to which, two, three, or four patients are compelled to use the same water, even though one may have ulcerated legs, are found fault with. In one or two there are not a sufficient number of basins for personal washing, or "the patients are not taught or encouraged to make use of them." In some, "cupboards for brooms, pails, and utensils" are wanting, while in others the benches have no backs, or the stairs no hand-rails. In one, knife-boxes are urgently required, the patients at present having free access to the carving-knives. In one asylum they felt it necessary to make some suggestions "regarding the access of the engineer or stoker to the laundry department," in consequence of "some very unpleasant events that have occurred in other asylums from the want of proper precaution." Earth-closets are found in a few asylums. In the Prestwich Asylum, in which "there is an entire absence of offensive odor," they are in general use; in the Salop Asylum, earth-closets of a better construction than the commissioners had previously seen, both movable and stationary, seemed to act remarkably well; while in the North Riding Asylum, although they have been advantageously introduced into the airing-courts, they have proved failures in the wards, materially interfering with the purity of the atmosphere, but the commissioners found some of them *filled with water*. This result is not very wonderful.

It does not fall within the scope of the commissioners' duties to notice the medical treatment of the patients. In a few instances, however, they strongly protest against the excessive use or abuse of medicines, and in one case the offending party is a lady. In their remarks on the Oxford County Asylum, the following sentence occurs: "Twenty-four, seven males and seventeen females, appear as under medical treatment; but there are also as many as sixty of both sexes taking medicine, the majority of whom seem to have it administered to them at the discretion of the head female attendant.

We have a high opinion of Miss White, who is an excellent officer, but there are obvious objections to this arrangement, which ought at once to be discontinued."

One mode of treatment employed in the Cornwall Asylum is so remarkable that the commissioners notice it at some length, and discuss its merits somewhat severely. A female patient, Grace Axworthy, complained that she had been more than once placed, by the medical superintendent, on bread-and-water for several days. This statement was found to be substantially correct, and the explanation given by the superintendent, Mr. Adams, was as follows: The woman has been in the asylum since 1861. Two years ago, during his absence, she was placed for five days on bread-and-water, by his assistant medical officer, and on two late occasions he has prescribed the same diet, on one occasion for two and on the other for three days. He justifies his procedure on the grounds that it should be regarded as "treatment," and not as "punishment." "He describes it" (say the commissioners) "as being resorted to in consequence of its being found that all the modes ordinary in asylums for subduing excitement" were inapplicable to this one particular case, which he says is one of "moral insanity." Never having been able to discover what "moral insanity" means, if it does not mean the merely vicious nature which impels to wickedness or crime, and not thinking that asylums can with any advantage (even if it were allowable to make the attempt) be turned into prisons or reformatories, we do not approve of the treatment adopted to this woman, who ought in our opinion to be discharged at once, if the ordinary methods of dealing with the insane are found to be inapplicable to her; and we desire thus to bring the matter under the notice of the committee of visitors as well as of our own board."

From the perusal of that part of the report which treats of the metropolitan Licensed Houses, the reader may acquire a great deal of useful information regarding our best retreats for the higher class of insane persons, and I would especially direct attention to the notices of Blacklands (for 20 gentlemen), Earls' Court House (for 30 ladies), Hendon House (for 12 ladies), Lawn House (for 6 ladies), Montague House (for 12 gentlemen), Moorcroft House (for 46 gentlemen), Otto House (for 31 ladies), Sussex and Brandenburg Houses, belonging to Dr. Forbes Winslow (for 37 gentlemen and 21 ladies), and Wood End (for 18 ladies).

Strongly in contrast with these luxurious retreats are the metropolitan establishments for the reception of insane paupers, viz., Bethnal House, which receives 240 pauper and 140 private patients; Cam

berwell House, where they are in the ratio of 220 to 180; Grove Hall, where the relative numbers are 320 and 122; Hoxton House—the notorious Miles's mad-house of the end of the last century—where the pauper are to the private patients as 321 to 691; and Peckham House, containing 242 pauper and 63 private patients. In all these houses the rates of payment for the private patients, who belong exclusively to the lower classes, are comparatively low.

In the last-named house a very remarkable and discreditable incident occurred, which the commissioners seem not to have treated with the severity that might have been expected. A Jewish visitor, who had come to cheer up and sympathize with the Israelite inmates of the male pauper ward, was unfortunately mistaken for a patient and treated accordingly. The nature of the treatment that was brought to bear on the unhappy philanthropist is not stated. How such an absurd mistake could have been made in any moderately well-managed institution it is difficult to see.

One of the most important duties of the commissioners, and one that often gives them an extreme amount of trouble, is that of enforcing compliance with the law applicable to the insane under single private care. It is often very difficult to discover the cases in which the law is thus violated, as may be seen from some of the instances recorded in the report.

During the past year they have had occasion to report to the Lord Chancellor several cases for inquisition in lunacy; and the facts of one of these cases are of so extraordinary and almost incredible a nature that I shall give them without abbreviation.

It came to their knowledge (how, they do not tell us) that a gentleman, reported to be wealthy, and about thirty-five years of age, had been for some years living in extraordinary seclusion at the chief hotel in B——, in the county of ——. Inquiry brought out further facts, e. g., that the acting manager of the hotel, whom they examined, had alone any access to him, and that the gentleman's habits generally were scarcely consistent with sanity. An order to visit was therefore obtained by them from the Lord Chancellor, and a medical member of the board immediately executed the order. His report was as follows:

"On arrival at the hotel, I acquainted the landlady of the character and object of my visit, and I inquired for Mr. M., her acting manager. He, however, was not forthcoming. Our secretary (whose attendance I had required in the absence of all my colleagues, otherwise engaged) and myself thereupon immediately made our way up-stairs to Mr. A.'s rooms, on the first floor. Their position I previously knew,

but the landlady pointed out the door. Going through the door, we suddenly came upon Mr. M. in an antechamber. He evinced much consternation so soon as he recognized us and learned my mission. Giving no heed to his stammering entreaty for some delay in the matter, I instantly put him aside and directly passed through another door into an inner and perfectly dark room. As we entered it, a loud voice, issuing from the darkness, that of a man under surprise and in alarm, demanded repeatedly what was the matter, who was making the entry, etc., etc. Making conciliatory reply, and stating the official and friendly nature of our visit, we called for lights from Mr. M., and groped our way onward, but the chaos of lumber in the place soon brought us to a stand-still. Two candles were then quickly produced and lighted. The scene which presented itself baffles description. From wall to wall, and to a considerable height from the floor, the room was literally blocked up with a heterogeneous mass of furniture and rubbish, from the midst of which emerged the head of a middle-aged and dark-bearded man. A single tortuous lane led, through this lumber, toward him. As we picked our way some destruction of glass and crockery was unavoidable; we could only get through the furniture edgewise, the floor was so strewn with rubbish that it was scarcely possible to find any clear space whereon to tread. Any catalogue of the contents of the room I am wholly unable to give. Piled upon what appeared to be a medley of chairs and tables and also lying in confusion underneath, were bottles of all sorts and sizes, full and empty, great quantities of newspapers, bundles of candles, broken jugs, pans and basins, old clothes, plates of all kinds, large baskets, a clock, parcels of stale biscuits, tin buckets, one upon another, every thing in disorder, and nothing apparently for use. No fire was in the grate, the curtains were drawn across the window, no daylight visible. Behind a table covered with innumerable bags, lay Mr. A. on a small broken-down horse-hair sofa, in the centre of this mass, and closely hemmed in on every side by it. Mr. A. was not lacking in courtesy. He insisted on holding for me one of the candles we had obtained, the other was soon fixed in the neck of an empty wine-bottle; there, standing, for no chair was available, we conversed with Mr. A., face to face, for nearly two hours. Mr. M. quitted the room by my desire so soon as we had obtained the candles. Mr. A. was enveloped in a rug, and, I believe, was without any other clothing. His face was tolerably clean, but somewhat pale, his bare arms were lean, and his right hand very dirty, the nails of both hands of extraordinary length and begrimed. He stated that he was in perfect health, nevertheless he

complained of rheumatism in the knees and fingers; he also admitted that he could not walk, or even stand up, in consequence of recent contraction of his legs, and that his sleep at night was usually broken. His manner was highly nervous, and his speech somewhat hesitating, but he betrayed no delusions whatever. His observations and replies were often, indeed, very acute, and his conversation showed that he must have received a good education. His gentlemanly demeanor contrasted throughout my interview most painfully with his disgraceful condition. The strongest proof, and I might almost say the only proof, of his insanity was his own explanation of what we saw. He insisted that the spectacle was simply the result of faulty habits which had gradually overpowered him, and from which no one would take the trouble to free him. When pressed to explain why he did not long ago resume his clothing (which he said was abundant, and about the room), get up, pay his bill, leave the hotel, go elsewhere, and live otherwise, he answered that, though for many years, and still, most anxious to do all this, no one would arrange it for him. He repeatedly declared that no opposition had ever been made to his departure by any person, but his complaint was that no one would help him to leave, and it was impossible for him to leave or move in the matter without such previous help. He strongly expressed his dislike of the hotel, and of the landlady. He spoke in no friendly terms of Mr. M., but chiefly because he would not actively assist him in leaving the hotel. That he had not washed for years he did not conceal; he said that he abstained from the use of water because he found that washing aggravated the rheumatism in his fingers. His abstemious living (consisting always of only two meals, tea at 5 P. M., and three cutlets with water or tea at 10 P. M.) he explained as a mode of expressing his unfavorable opinion of the hotel accommodation, and desire of leaving immediately. He had persisted in wearing nothing save the rug, because he had made a sort of promise to himself, not exactly an oath or a vow, that he would wear no clothing until he could get away from his present quarters. Mr. A. freely admitted that he never had any light during the day before 5 P. M., but candle-light thereafter during the night, and that he used no bed. I am satisfied that, for a considerable period, his crippled condition, and the blocked-up state of the room, must have made it very difficult, if not impossible, for him to leave the sofa. Mr. A. stated that he occasionally read the newspapers but not often, because it drew away his attention from the chief object of his life, which was to induce somebody to effect his removal from his present position. He over and over again insisted that it was impos-

sible for him to leave without aid, but that he should be delighted to leave if any person would arrange it. He denied that] he was troubled by vermin on his person, but asserted that some years ago, when the outside walls of the hotel had been painted, an incursion of fleas had annoyed him; these, however, were shortly got rid of. It is needless for me to say that the atmosphere of the room was very offensive. Mr. A. owned the possession of a large income from entailed colonial property, which he said was managed by a gentleman holding a high official appointment, whose name he declined to give, and in whose probity he had perfect faith. He admitted also his ownership of a farm near B—, managed by a Mr. L., a veterinary surgeon, in whose integrity he had also perfect faith, but he never called upon either gentleman to account, and neither had rendered any account to him for a very long period. This matter gave him no anxiety; so soon as he left the hotel he could and would then attend to every thing, but, till then, to nothing save his liberation from his present quarters. Mr. A. informed me that he had no relation or friend to whom he could or would apply for assistance in leaving the hotel. He especially deprecated any communication of his present position to his only relative, an aunt, whose name or address he declined to give. He strongly objected to our visit, and to any visit by any person, as he was unwilling that his miserable condition should be witnessed, and himself thereby further disgraced. He strenuously insisted that no conclusion as to his insanity should be drawn by me from what I then saw, but that I should judge of his mental condition by the rationality and coherency of his statements, and that to act otherwise would be most cruel and unfair. Mr. A. was so keenly sensitive to his position that he more than once desired me not to scrutinize his wretched covering, or the articles in disorder about the apartment. He also deprecated any examination by me of his crippled legs, but chiefly because he did not wish to learn that they were, contrary to his belief, permanently contracted. I gathered from Mr. A.'s statement that he had been in his present seclusion for very many years, and that the last person he had seen prior to our entrance into the room, save Mr. M., since September, 1869, was Mr. L., with whom he had then finally quarrelled and refused again to see, because he, like Mr. M., would not assist in extricating him from his extraordinary mode of life. The landlady admitted, a few days ago, at the Lunacy Office, hotel charges against Mr. A. at the rate of £400 to £500 per annum. He has three rooms, each leading into the other; he, however, occupies one room only, that in which I found him. In the antechamber only

is there an occasional fire. I did not inspect the bedroom, being anxious to spare Mr. A.'s feelings as much as possible. The apartment occupied by Mr. A. is spacious, and some engravings hang on the walls; but the papering is tattered, and the ceiling is very smoky and dirty; with the anteroom it formed the assembly-room at the hotel. Both have the appearance of long neglect, but that occupied by Mr. A. personally is alone in the extraordinary condition which I have attempted to describe. It is evident that it has not been cleaned for years. The accumulation of lumber and rubbish, which looks like the work of years, also was explained by Mr. A. in much the same way as every thing else about him. An offensive remark from an old housemaid, who had long since left the hotel, had, he said, originated his refusal to have any thing cleared away or touched there by her, but his constant anxiety to leave the hotel had been the sole cause of the subsequent neglect. Mr. A., in answer to questions, further said that his door was usually locked day and night by Mr. M., but by his own express desire, to prevent intrusion, and he asked whether, if it had been locked, we could have forced it; to which inquiry he received no direct reply, but I assured him that our visit was solely for his relief and welfare. He alluded to the Wyndham inquisition, and protested that he would oppose all proceedings in lunacy to the utmost of his power. Before I left him I obtained his promise that he would see some medical gentleman upon the question of his sanity, which question Mr. A. told me that he had himself often thought would be raised by the Commissioners in Lunacy or otherwise. He ultimately assented to seeing Dr. C., of the county asylum, as having known him in former years."

Dr. C. concurred with the commissioners in thinking that Mr. A. was a person of unsound mind within the meaning of the lunacy acts, and not under proper care and control. The usual statutory proceedings in such a case were next adopted, and, by an order of justices, Mr. A. was removed to the county asylum. Dr. C. thus described the interview:

"On obtaining lights, a most painful and sad sight presented itself. By the side of the door sat the poor man, huddled up on what appeared to be a chair, holding several rugs round his body to cover his nakedness, which he seemed anxious to conceal. His hair, which he informed me had not been combed or brushed for a very long time, was hanging wildly down his back, and very much matted. His face presented a pale and anxious look. Being desirous to know the state of his limbs, I prevailed upon him, with great difficulty, to permit an

examination. When doing so he stated that his knees were fixed from lying so much in one position; and, after attempting to move his limbs, which I did under difficulties, and causing pain, I am led to fear they are in a permanently crippled state. His feet were covered with a large quantity of rags, over which was a covering which I cannot describe, but which looked like American cloth. His legs, arms, and hands were very dirty, and his nails very long and full of filth; the surface of the body emitted a most offensive odor. In his general conversation he betrayed little evidence of unsoundness of mind. He, however, made the following statement: that previous to his going into seclusion, which he now deeply regretted, he felt himself for some time different from other young men; that he felt he was looked upon by the people as a lunatic; that he gave way to his feelings, with the result I now saw before me; that from the first he determined to give up leading such a life, but that daily he felt he became more powerless from want of physical strength; that he felt quite ashamed, and that the state of his rooms was a disgrace to a man in his position; that he was most anxious to leave where he was; that he prayed daily that some one would turn up who could assist him in carrying out his wishes; that frequently, when he heard the people talking together below his windows, he exclaimed, 'O God! when shall I be assisted out of this state, and be able to mix again with the world?'

"During the time he made the above statement, his feelings seemed frequently much affected.

"He stated that he had for some time refused to see any friends—among others, Mr. L.—because they did not assist him out of his present position.

"He then asked me if I considered him of unsound mind, and on my replying that certainly his present state, and the state in which I found his rooms, were calculated to make me think so, his reply was: 'You now give me an opportunity to explain. I grant you if I had my rooms in such a state, and at the same time felt that it was right and proper, I then labored under a delusion, and was insane; but when I tell you that I am quite disgusted with the state of matters, and that I pray for assistance to alter them entirely, the case is widely different.' He gave no reason for not wearing any clothes, and concluded by saying that, if any attempt was made to make him out insane, he would spend his whole fortune to prove the contrary, quoting at the same time the case of Wyndham."

Of the bedroom, which the visiting commissioner had refrained from entering, Dr. C. wrote:

"Seeing a door close to this couch entering into another room, seemingly intended as a bedroom, I opened it, and found this room even worse than the one he occupied; for, in addition to all sorts of rubbish, I discovered a number of bedroom utensils filled with excrement, some of which had not been emptied for a length of time; also large quantities of filthy papers over the floor, and, I need not say, a great stench proceeding from the utensils; in fact, it was excessive, and calculated at any time to cause typhoid fever or such-like disease in the hotel."

The condition of Mr. A., when he was brought to the asylum, was thus described by the medical superintendent:

"The patient, owing to his crippled condition, was obliged to be carried, from the cab in which he was brought, into the asylum. He was placed on a chair, in which he appeared unable to sit upright, but cowered down with his head bent over his knees, drawing at the same time a large piece of baize around him, concealing his features, which, when exposed, were nervously agitated. His countenance was pale and haggard, but his body generally was fairly well nourished. His beard was shaggy and untrimmed, fully two feet in length, but the lower two-thirds were inextricably matted together with filth, and contained numerous vermin. His hair was even more matted and dirtier than the beard, especially on each side, over the ears, being in this condition more than a foot in length. His apparel consisted of the above-mentioned piece of baize; under this a piece of greasy and filthy canvas around his shoulders, fastened with long pins, while around his loins was a still more disgustingly filthy knotted clout, fastened in the same manner, but so narrow and worn as to be totally inadequate and useless for the purpose for which it was apparently intended. His body was otherwise in a state of nudity. His feet were clouted with old and dirty American cloth externally, while under this was an admixture of filthy rags, paper, and refuse, tied with numerous strings about his toes, feet, and ankles, the condition of which was filthy beyond description; the great-toe nails were an inch and a half in length, that of the nails diminishing in proportion. The finger-nails were also enormously long, and, with the hands, very filthy. His knees were much bent, in a flexed position, the flexor tendons remaining rigid and prominent; the legs formed nearly a right angle with the thigh, resisting any extension, but permitting the slightest degree of extra flexion; there was but little comparative pain caused on manipulation; there was no swelling, tenderness, or indication of active disease, the affection being apparently due to continued maintenance of one position, causing a permanent stiffness.

"The patient was at first irritable and nervously anxious to avoid exposure and to explain the reasons he had for being in such a condition; thus, his hair was matted together and kept long for the sake of warmth, and formed a protection for his ears; his beard protected his chest; his feet were thus covered up for the sake of warmth. He appeared thoroughly ashamed, begged that no one might see the hair that was cut off, or the old rags with which he had covered himself. All his statements were made in a disconnected manner; he talked a great deal, but every now and then lost the thread of his discourse, and begged to be reminded of what he had been saying. He stated that the rough and indelicate manner in which the whole proceedings had been conducted had made an injurious impression on him, never to be recovered from, and that it was almost equivalent to signing his death-warrant. After he had had a bath, in which he proceeded to cleanse himself vigorously, he was placed in bed, and, as he looked wearied after his exertion, some warm brandy-and-water was administered. He was then visited by me, when he seemed much more composed, and stated that he wished I had deferred my visit, since the spirits he had taken had mounted to his head, and might make him appear strange. He also stated that, if he could only have seen me a few years ago, he would never have been in this condition, since he only required some one to assist him, and that hard-hearted M. had no sympathy for him; that, while he appreciated the comforts resulting from the interference on his behalf, he could not help characterizing the whole method of proceeding as rough and unkind, and as calculated to affect injuriously his mind. He was very anxious about the state of his limbs, and said that so long as he was in the asylum he would cheerfully afford every facility for promoting their recovery. During this visit he became quite cheerful, and even laughed.

"He was very indignant when told that it would be necessary to use means for destroying the vermin, declaring, in an excited and energetic manner, that the existence of lice was impossible about his person, since he was very sensitive and particular on these points, and that he had frequently watched carefully whenever his skin was irritable, and must have known had they been present. He refused to use means for destroying the vermin until he had ocular proof of their presence; but after a few minutes' consideration he anxiously, and in an impressive manner, declared that he knew now very well what had been seen in his hair, since they were very small, white flies, which he himself had noticed, and which had been about in excessive numbers during the past summer; that he should persist in the denial of the existence

of lice, since it might be an important element in any future inquiries that might take place, and which he seemed to indicate he should endeavor actively to promote. He expressed himself highly satisfied with the manner in which he had been treated in the asylum. He at first refused all food; but after a little persuasion was induced to take some tea and toast. During the conversation he frequently rambled, and was occasionally almost incoherent in his statements. He was more or less nervously agitated throughout. His powers of memory appeared remarkably good, and his conversation was, as a rule, marked by shrewdness and intelligence of no mean order. The only semblance to a delusion was his idea, frequently repeated by him, that it was necessary to have some one of stronger will than his own, which he found inadequate, to assist him in resuming his position in society."

Having thus far remedied the personal condition of Mr. A., the commissioners next instituted an inquiry into his property. They then learned that Mr. A., in 1856, became, under his father's will, the life-tenant of considerable landed estates in the colonies and in this country; that he had also become entitled, under that will, to a life-interest in personalty to the value of £100,000 and upward; that he had not alienated that property, but that, on the contrary, there were accumulations of his income. They also ascertained that he had made a will, giving all his property to an aunt, his sole relative, and that to her he had also given, verbally, but for her life only, a mansion belonging to him in the west end of London. As to his previous history and expenditure, we ascertained that he had been an officer in the army, and that about September, 1857, he was with his regiment at —, where he made the acquaintance of Mr. L., and employed him professionally; that in that year the regiment was disbanded, and that he then left for B—, and took up his abode at the hotel. At first Mr. A. had a sitting-room upon the ground floor, and a bedroom shortly afterward he had a second bedroom for an occasional visitor; subsequently he arranged to have the assembly-room on the first floor, and a bedroom adjoining thereto.

It seems that he originally had agreed to pay £2 12s. 6d a week, upon condition that he gave up the assembly-room, when required, for public meetings or large parties; afterward, when he objected to fulfil that condition, the rent was raised (in the spring of 1866), to £200 a year, and (in the spring of 1869), to £300 a year. Mr. A.'s yearly bill for board was £180, or thereabouts. Mr. A.'s relative had, in 1858, an interview with him in the ground-floor sitting-room, as to which she said that he received her most kindly, and told her that he

had come thither hoping to amuse himself with his horses, etc., but that, from constant suffering, "life was a burden to him," and he also deplored his possession of so much property. His habits were then, it seems, those of a gentleman, but he appears always to have dressed in a style far below his condition in life. He afterward visited her in London occasionally. She stated that he was then very cleanly as to his person, and as to his personal linen. At this period he had a few sporting acquaintances in the neighborhood of B——. Toward the close of 1858, Mr. A. took a lease for twenty-one years of a farm near B——, containing one hundred and fifty acres, at a yearly rent of £300. In 1859, Mr. A. suddenly went to Germany. He shortly, however, returned to the hotel, and in 1860 gave to Mr. L. the management of stud and farm. He then ceased to visit his relative, and, as far as the commissioners could ascertain, no person after 1863 was admitted into his room save Mr. L. and the manager of the hotel. His aunt wrote to him on many occasions after 1860, and specially in the spring of 1867, when she notified to him her intention to marry, and afterward her marriage, but he never took any notice of her letters. She also went to the hotel about once a year, and sought to see him, but was always told by the landlady or her sister that Mr. A. saw no one. She never insisted on seeing him, because she did not desire to offend him. Her last visit to B—— was apparently in April, 1870. Up to September, 1868, Mr. L. was a constant visitor to Mr. A. After that date the manager of the hotel alone had access to him. From 1860 Mr. A. had about seventy horses in charge of Mr. L., which were never used after they came into his possession, besides thirty carriages which were also never used. While at the hotel Mr. A. also bought two or three houses; these he never occupied or attempted to let; he took leases of farms in the neighborhood; Mr. L. was his agent to look after these horses, farms, and houses, yet no account could they find to have been rendered by him.

Judging it to be their duty, in these circumstances, to report Mr. A.'s case to the Lord Chancellor for an inquisition, they did so on the 14th of November last.

Mr. A. was then visited by Dr. L. Robertson, at the Lord Chancellor's desire. Dr. Robertson had "no doubt whatever of Mr. A.'s mental unsoundness, and of his entire unfitness to be intrusted with the charge of himself or of his large property." Their report was accordingly then filed by the solicitor to the Suitors' Fund, in the ordinary course taken in such cases.

Proceedings upon this report stood over from Michaelmas Term last, upon the unopposed application of Mr. A., and evidence of his

mental improvement, until Hilary Term of this year. In Hilary Term there was another postponement for similar reasons till Easter Term. All proceedings upon the report were then stayed and determined upon the ground of Mr. A.'s sanity, and it was ordered by the Lords Justices that he should have the full management and control of his property. The discharge of the patient from the asylum followed as a matter of course.

Such is the history of this extraordinary case, up to the present time; it is however, probable, that we have not yet heard the end of it.

Tylor's Primitive Culture.

IN the present volumes,¹ the author carries on the investigation of culture into other branches of thought and belief from those he had discussed in his former work.

He begins with the consideration of "The Science of Culture," which he regards as synonymous with civilization, and defines as "that complex whole which includes any capabilities and habits acquired by man as a member of society."

He then traces the course which civilization has actually followed through successive stages, by "permanence, modification, and survival." The first two of these terms are sufficiently obvious in their meaning. Regarding "survivals," he describes them as "processes, customs, opinions, etc., which have been carried on by force of habit into a new state of society different from that in which they had their original home, and they thus remain as proofs and examples of an old condition of culture out of which a newer has been evolved. Thus, I know an old Somersetshire woman whose hand-loom dates from the time before the introduction of the 'flying shuttle,' which new-fangled appliance she has never even learned to use, and I have seen her throw her shuttle from hand to hand in true classic fashion; this old woman is not a century behind her times, but she is a case of survival. Such examples often lead us back to the habits of hundreds and even thousands of years ago. The ordeal of the key and Bible, still in use, is a survival; the midsummer bonfire is a survival; the Breton peasant's All-Souls' supper for the spirits of the dead is a survival. The simple keeping up of ancient habits is only one part of the tran-

¹ Primitive Culture. Researches into the Development of Mythology, Philosophy, Religion, Arts, and Custom. By Edward B. Tylor, Author of "Researches into the Early History of Mankind," etc. 2 vols. 8vo, pp. 453 and 426. London, 1871.

sition from old into new and changing times. The serious business of ancient society may be seen to sink into the sport of later generations, and its serious belief to linger on in nursery folk-lore, while superseded habits of old-world life may be modified into new-world forms still powerful for good and evil. Sometimes old thoughts and practices will burst out afresh, to the amazement of a world that thought them long since dead or dying; here survival passes into revival, as has lately happened in so remarkable a way in the history of modern spiritualism, a subject full of instruction from the ethnographer's point of view" (p. 15).

Most of our readers will agree with the author regarding the philosophy of religion. Notwithstanding all that has been written to make the world acquainted with the lower theologies, the popular ideas of their place in history, and their relations to the faiths of higher nations, are still (as Mr. Tylor gently puts it), "of the mediæval type." It is in the highest degree painful to compare and contrast many missionary journals with the thoughtful and appreciative essays of Max Müller. Few who have read those essays will ever again think it ridiculous to master the general principles of savage religions, or to regard as superfluous the knowledge thus acquired. The extent to which the religions of the higher races at the present day are indebted to earlier Eastern theologies is totally unsuspected by those who have not studied the subject.

In the second chapter, devoted to "the Development of Culture," the progression and degeneration theories are fully discussed. "Under proper limitations" (he observes), "the principles of both theories are conformable to historical knowledge, which shows us, on the one hand, that the state of the higher nations was reached by progression from a lower state, and, on the other hand, that culture gained by progression may be lost by degradation" (p. 34).

Traditions may be urged in support of either the progression or the degradation theory; and, while they may be partly true, they must be partly untrue. The early Chinese traditions, those handed down to us by Lucretius, and many others, refer to an ancient savage condition of mankind, while the Parsee and the Buddhist look back to the glorious ages when there was no sin nor misery.

Arrest and decline in civilization act frequently and powerfully on national life. "That knowledge, arts, and institutions, should decay in certain districts; that peoples once progressive should lag behind and be passed by advancing neighbors; that sometimes even societies of men should recede into rudeness and misery—all these are phenom

ena with which modern history is familiar. In our great cities, the so-called 'dangerous classes' are sunk in hideous misery and depravity. If we have to strike a balance between the Papuans of New Caledonia and the communities of European beggars and thieves, we may sadly acknowledge that we have in our midst something worse than savagery. But it is not savagery; it is broken-down civilization. Negatively, the inmates of a Whitechapel casual ward and of a Hot-tentot kraal agree in their want of the knowledge and virtue of the higher culture. But, positively, their mental and moral characteristics are utterly different. Thus, the savage life is essentially devoted to gaining subsistence from Nature, which is just what the proletarian life is not. Their relations to civilized life—the one of independence, the other of dependence—are absolutely opposite. To my mind, the popular phrases about 'city savages' and 'street Arabs' seem like comparing a ruined house to a builder's yard. It is more to the purpose to notice how war and misrule, famine and pestilence, have again and again devastated countries, reduced their population to miserable remnants, and lowered their level of civilization, and how the isolated life of wild country districts seems sometimes tending toward a state of savagery. So far as we know, however, none of these causes have ever really reproduced a savage community."

After referring to the unhappy colony of Tomi, on the Black Sea (described by Ovid, *Ex Ponto*, iii., 8), as possibly a case in point, he adds that "cases of exceptionally low civilization in Europe may, perhaps, be sometimes accounted for by degeneration of this kind. But they seem more often the relics of ancient unchanged barbarism. The evidence from wild parts of Ireland two or three centuries ago is interesting from this point of view. Acts of Parliament were passed against the inveterate habits of fastening ploughs to the horses' tails, and of burning oats from the straw to save the trouble of thrashing. Fynes Moryson's description of the wild or 'meere' Irish, about 1600, is amazing. The very lords of them, he says, dwelt in poor clay houses, or cabins of boughs covered with turf. In many parts men as well as women had in very winter-time but a linen rag about their loins and a woollen mantle on their bodies, so that it would turn a man's stomach to see an old woman in the morning before breakfast. He notices their habit of burning oats from the straw, and making cakes thereof. They had no tables, but set their meat on a bundle of grass. They feasted on fallen horses, and seethed pieces of beef and pork with the unwashed entrails of beasts in a hollow tree, lapped in a raw cow's-hide, and so set over the fire, and they drank

milk warmed with a stone first cast into the fire. Another district remarkable for a barbaric simplicity of life is the Hebrides. In 1868 Mr. Walter Morrison there bought from an old woman at Stornoway the service of earthenware she was actually using, of which he gave me a crock. These earthen vessels, unglazed, and made by hand, without the potter's wheel, might pass in a museum as indifferent specimens of savage manufacture. Such a modern state of the potter's art in the Hebrides fits well with George Buchannan's statement in the sixteenth century, that the islanders used to boil meat in the beast's own paunch or hide. Early in the eighteenth century Martin mentions as prevalent there the ancient way of dressing corn by burning it dexterously from the ear, which he notices to be a very quick process, thence called 'graddan' (Gaelic, *grad*=quick). Thus we see that the habit of burning out the grain, for which the 'meere Irish' were reproached, was really the keeping up of an old Celtic art, not without its practical use. So the appearance in modern Celtic districts of other wide-spread arts of the lower culture—hide-boiling, like that of the Scythians in Herodotus, and stone-boiling, like that of the Assiniboins of North America—seems to fit not so well with degradation from a high as with survival from a low civilization. The Irish and the Hebrideans had been for ages under the influence of comparatively high civilization, which, nevertheless, may have left unaltered much of the older and ruder habits of the people" (pp. 40, 41).

As further illustrations of degradation, the author notices those cases in which civilized men settled in outlying districts, and co-habiting with a lower race, as the descendants of the mutineers of the Bounty, who took Polynesian wives; the Gauchos, a mixed Spanish and Indian race, etc.

From this subject he proceeds to point out that the master-key to the investigation of man's primeval condition is held by prehistoric archæology. "This key," he observes, "is the evidence of the stone age, proving that men of remotely ancient ages were in the savage state. Ever since the long-delayed recognition of M. Boucher de Perthes's discoveries (1841 and onward) of the flint implements in the drift gravels of the Somme Valley, evidence has been accumulating over a wide European area to show that the ruder stone age, represented by implements of the paleolithic or drift type, prevailed among savage tribes of the quaternary period, the contemporaries of the mammoth and the woolly rhinoceros, in ages for which geology asserts an antiquity far more remote than history can avail to substantiate for the human race. Mr. John Frere had already written in

1797 respecting such flint instruments discovered at Hoxne in the Suffolk '*Archæologia*.' The vast lapse of time through which the history of London has represented the history of human civilization is, to my mind, one of the most suggestive facts disclosed by archæology. The antiquary, excavating but a few yards deep, may descent from the *débris* representing our modern life, to relics of the art and science of the middle ages, to signs of Norman, Saxon, Romano-British times, to traces of the higher stone age. And on his way from Temple Bar to the Great Northern Station he passes near the spot ('opposite to black Mary's, near Grayes-Inn Lane') where a drift implement of black flint was found with the skeleton of an elephant by Mr. Conyers, about a century and a half ago, the relics side by side of the London mammoth and the London savage. In the gravel-beds of Europe, the laterite of India, and other more superficial localities, where relics of the paleolithic age are found, what principally testify to man's condition are the extreme rudeness of his stone implements and the absence of even edge-grinding. The natural inference that this indicates a low savage state is confirmed in the caves of Central France. There a race of men, who have left indeed really artistic portraits of themselves, and the reindeer and mammoths they lived among, seem, as may be judged from the remains of their weapons, implements, etc., to have led a life somewhat of Esquimaux type, but lower by the want of domesticated animals. The districts where implements of the rude primitive drift type are found are limited in extent. It is to ages later in time, and more advanced in development, that the neolithic or polished-stone period belonged, when the manufacture of stone instruments was much improved, and grinding and polishing were generally introduced. During the long period of prevalence of this state of things, man appears to have spread almost over the whole habitable earth. The examination of district after district of the world has now all but established a universal rule that the stone age (bone or shell being the occasional substitutes for stone) underlies the metal age everywhere. Even the districts famed in history as seats of ancient civilization show, like other regions, their traces of a yet more archaic stone age" (pp. 53, 54).

The chapter concludes with a very interesting sketch of the continuous progress of improvement from the earliest time that is seen in the construction of various weapons, in fire-making, musical instruments, etc., and we then come to the subject of "Survival in Culture," to which about eighty pages of the volume are devoted. We have already explained the meaning that Mr. Tylor attaches to the word

"survival," and will only remind our readers that it denotes the historical fact which the word "superstition" is now spoiled for expressing, in consequence of its being used as a term of reproach. Among survivals used in this sense he includes various children's games, games of chance, traditional sayings, nursery poems, proverbs, riddles, sneezing formulæ, rites of foundation sacrifice, prejudices against saving a drowning man, tragical powers and processes, omens, augury, oneiromancy, heiruspeccation, scapulimancy, chiromancy, cartomancy, rhabdomancy, dactiliomancy, coscinomancy, astrology, witchcraft, and spiritualism in its various manifestations.

If space permitted, we should gladly make copious extracts from Mr. Tylor's chapters on this subject, but we must content ourselves with two quotations, the former of which treats of "The Rites of Foundation Sacrifice:"

"There is current in Scotland the belief that the Picts, to whom local legend attributes buildings of prehistoric antiquity, bathed their foundation-stones with human blood; and legend even tells us that St. Columba found it necessary to bury St. Oram alive beneath the foundation of his monastery, in order to propitiate the spirits of the soil who demolished by night what was built during the day. So late as 1843, in Germany, when a new bridge was built at Halle, a notion was abroad among the people that a child was wanted to be built into the foundation. These ideas of church, or wall, or bridge, wanting human blood or an immured victim to make the foundation steadfast, are not only wide-spread in European folk-lore, but chronicle or tradition asserts them as matter of historical fact in district after district. Thus, when the broken dam of the Nogat had to be repaired in 1463, the peasants, on the advice to throw in a living man, are said to have made a beggar drunk, and buried him there. Thuringian legend declares that, to make the Castle of Liebenstein fast and impregnable, a child was bought for hard money of its mother, and walled in. She was eating a cake while the masons were at work, the story goes, and it cried out: 'Mother, I see thee still;' then later, 'Mother, I see thee a little still;' and, as they put in the last stone, 'Mother, now I see thee no more!' The wall of Copenhagen, legend says, sank as fast as it was built; so they took an innocent little girl, set her on a chair at a table with toys and eatables, and, as she played and ate, twelve master-masons closed a vault over her; then, with clanging music, the wall was raised, and stood firm ever after. Thus Italian legend tells of the bridge of Arta, that fell in and fell in till they walled in the master-builder's wife, and she spoke her dying curse that the bridge

should tremble like a flower-stalk henceforth. The Slavonic chiefs founding Detinez, according to old heathen custom, sent out men to take the first boy they met and bury him in the foundation. Servian legend tells how three brothers combined to build the fortress of Stradra (Scutari); but, year after year, the demon (*vila*) razed by night what the three hundred masons built by day. The fiend must be appeased by a human sacrifice—the first of the three wives who should come bringing food to the workmen. All three brothers swore to keep the dreadful secret from their wives; but the two eldest gave traitorous warning to theirs, and it was the youngest brother's wife who came unsuspecting, and they built her in. But she entreated that an opening should be left for her to suckle her baby through, and for a twelvemonth it was brought. To this day, Servian wives visit the tomb of the good mother, still marked by a stream of water which trickles, milky with lime, down the fortress-wall. Lastly, there is our own legend of Vortigern, who could not finish his tower till the foundation-stone was wetted with the blood of a child born of a mother without a father. As is usual in the history of sacrifice, we hear of substitutes for such victims; empty coffins walled up in Germany, a lamb walled in under the altar in Denmark, to make the church stand fast, and the church-yard in like manner handselled by burying a live horse first. In modern Greece an evident relic of the idea survives in the superstition that the first passer-by after a foundation-stone is laid will die within the year, wherefore the masons will compromise the debt by killing a lamb or a black cock on the stone. With much the same idea German legend tells of the bridge-building fiend cheated of his promised fee, a soul, by the device of making a cock run first across; and thus German folk-lore says it is well, before entering a new house, to let a cat or dog run in" (pp. 95-97).

We do not venture to prolong the preceding extract, but we may add that it is far from including all the facts Mr. Tylor has collected upon this subject. He goes on to show that this blood-thirsty, barbaric rite not only lingered for a long time in Europe as history, but is still actually practised as a matter of religion among many African, Malay, and Asiatic peoples.

His remarks on "Witchcraft and Spiritualism" have an especial interest in the latter of these subjects, which has lately been prominently brought forward, and has given rise to much discussion.

"Witchcraft and spiritualism," he observes, "have existed for thousands of years in a closeness of union not unfairly typified in this verse from John Bale's sixteenth-century interlude concerning

Nature, which brings under one head the arts of bewitching vegetables and poultry, and causing supernatural movement of stools and crockery :

"Theyr wells I can up drye,
Cause trees and herbes to dye,
And slee all pulterye,
Whereas men doth me move :
I can make stoles to daunce
And earthen pottes to prounce,
That none shall them enhaunce,
And do but cast my glove."

The same intellectual movement led to the decline of both witchcraft and spiritualism, till, early in the present century, men thought that both were dying or all but dead together. Now, however, not only are spiritualists to be counted by tens of thousands in America and England, but there are among them several men of distinguished mental power. But, though it lies beyond my scope to examine the spiritualistic evidence for itself, the ethnographic view of the matter has, nevertheless, its value. This shows modern spiritualism to be in great measure a direct revival from the regions of savage philosophy and peasant folk-lore. It is not a simple question of the existence of certain phenomena of mind and matter. It is that, in connection with these phenomena, a great philosophic-religious doctrine, flourishing in the lower culture but dwindling in the higher, has reëstablished itself in full vigor. The world is again swarming with intelligent and powerful disembodied spiritual beings, whose direct action on thought and matter is again confidently asserted as in those times and countries where physical science had not as yet so far succeeded in extruding these spirits and their influences from the system of Nature.

Apparitions have regained the place and meaning which they held from the level of the lower races to that of mediæval Europe. The regular ghost-stories, in which the spirits of the dead walk visibly and have intercourse with corporeal men, are now restored and cited with new examples as "glimpses of the night-side of Nature," nor have these stories changed either their strength to those who are disposed to believe them, or their weakness to those who are not. As of old, men live now in habitual intercourse with the spirits of the dead. Necromancy is a religion, and the Chinese manes-worshipper may see the outer barbarians come back, after an heretical interval of a few centuries, into sympathy with his time-honored creed. As the sorcerers of barbarous tribes lie in bodily lethargy or sleep while their souls depart on distant journeys, so it is not uncommon in modern spiritualistic

narratives for persons to be in an insensible state when their apparitions visit distant places, whence they bring back information, and where they communicate with the living. The spirits of the living as well as of the dead, the souls of Strauss and Carl Vogt, as well as of Augustine and Jerome, are summoned by mediums to distant spirit-circles. As Dr. Bastian remarks, if any celebrated man in Europe feels himself at some moment in a melancholy mood, he may console himself with the idea that his soul has been sent for to America, to assist at the "rough fixings" of some backwoodsman. Among the influences which have combined to bring about the spiritualistic renaissance, a prominent place may, I think, be given to the effect produced on the religious mind of Europe and America by the intensely animistic teachings of Emanuel Swedenborg, in the last century.

As a means of illustrating the relation of the newer to the older spiritualistic ideas, I now propose to glance over the ethnography of two of the most popular means of communicating with the spirit-world, by rapping and writing, and two of the prominent spirit manifestations, the feat of rising in the air, and the trick of the Davenport brothers.

The elf who goes knocking and routing about in the house at night, and whose special German name is the "Poltergeist," is an old and familiar personage in European folk-lore. From of old, such unexplained noises have been ascribed to the agency of personal spirits, who more often than not are considered human souls. The modern Dyaks, Siamese, and Singalese, agree with the Esths as to such routing and rapping being caused by spirits. Knockings may be considered mysterious but harmless, like those which in Swabia and Franconia are expected during Advent on the *Anklöpperleins-Nächte*, or "Little Knockers' Nights." Or they may be useful, as when the Welsh miners think that the "knockers" they hear underground are indicating the rich veins of lead and silver. Or they may be simply annoying, as when, in the ninth century, a malignant spirit infested a parish by knocking at the walls as if with a hammer, but, being overcome with litanies and holy water, confessed itself to be the familiar of a certain wicked priest, and to have been in hiding under his cloak. Thus, in the seventeenth century, the famous demon-drummer of Tedworth, commemorated by Glanvil, in the "*Saducismus Triumphatus*," thumped about the doors and outside of the house, and "for an hour together it would beat *Roundheads and Cuckolds*, the *Tat-too*, and several other *Points of War*, as well as any drummer. But popular philosophy has mostly attached to such mysterious noises a foreboding of death, the knock

being held as a signal or summons among spirits as among men. The Romans considered that the genius of Death thus announced his coming" (p. 128).

The knockings and rappings of more modern times down to the present date are then discussed, after which Mr. Tylor enters upon the subject of spirit-writing, floating in the air (in which he goes over the same ground as the author of "The Physics and Physiology of Spiritualism"), and the performances of tied mediums, which he traces from the time of Homer to the present day. "The untying trick," he observes, "as performed among savages, is so similar to that of our mountebanks, that, when we find the North-American Indian jugglers doing both this and the familiar trick of breathing fire, we are at a loss to judge whether they inherited these two feats from their savage ancestors, or borrowed them from the white men. The point is not, however, the mere performance of the untying trick, but its being attributed to the help of spiritual beings. This notion is thoroughly at home in savage culture" (p. 140).

We must venture upon one more short quotation from these chapters, which we regard as constituting the most interesting portion of these volumes :

"Suppose a wild North-American Indian looking on at a spirit-*séance* in London? As to the presence of disembodied spirits, manifesting themselves by raps, noises, voices, and other physical actions, the savage would be perfectly at home in the proceedings, for such things are part and parcel of his recognized system of Nature. The part of the affair really strange to him would be the introduction of such arts as spelling and writing, which do belong to a different state of civilization from his. The issue raised by the comparison of savage, barbaric, and civilized spiritualism, is this: Do the Red-Indian medicine-man, the Tartar necromancer, the Highland ghost-seer, and the Boston medium, share the possession of belief and knowledge of the highest truth and import, which, nevertheless, the great intellectual movement of the last two centuries has simply thrown aside as worthless? Is what we are habitually boasting of and calling new enlightenment, then, in fact a decay of knowledge? If so, this is a truly remarkable case of degeneration, and the savages, whom some ethnographers look on as degenerate from a higher civilization, may turn on their accusers and charge them with having fallen from the high level of savage knowledge" (p. 141).

Passing over the chapters on "Emotional and Imitative Language," and on "The Art of Counting," both of which abound in an accumula-

tion of varied lore, we come to the subject of "Mythology," to which no less than three long chapters are devoted, which it would be impossible for us to attempt to analyze. We must, therefore, content ourselves with giving a few extracts, as illustrating the mode in which the subject is treated :

"Of all things, what mythologic work needs is breadth of knowledge and of handling. Interpretations made to suit a narrow view reveal their weakness when exposed to a wide one. See Herodotus rationalizing the story of the infant Cyrus, exposed and suckled by a bitch : he simply relates that the child was brought up by a herdsman's wife named Spakò (in Greek, *Kynò*), whence arose the fable that a real bitch preserved and fed him. So far so good—for a single case. But does the story of Romulus and Remus likewise record a real event, mystified in the self-same manner by a pun on a nurse's name, which happened to be a she-beast's ? Did the Roman twins also really happen to be exposed, and brought up by a foster-mother, who happened to be called Lupa ? Positively, the 'Lemprière's Dictionary' of our youth (I quote the sixteenth edition, of 1831) gravely gives this as the origin of the famous legend ! Yet, if we look properly into the matter, we find, that these two stories are but specimens of a wide-spread mythic group, itself only a section of that far larger body of traditions in which exposed infants are saved to become national heroes. For other examples, Slavonic folk-lore tells of the she-wolf and the she-bear that suckled those superhuman twins, Waligora the mountain-roller, and Wyrwidak the oak-uprooter ; Germany has its legend of Dieterich, called Wolfdieterich, from his foster-mother the she-wolf ; in India the episode recurs in the tales of Satavahana and the lioness, and Sing-Baba and the tigress ; legend tells of Bruta-Chino, the boy who was cast into a lake, and preserved by a she-wolf to become the founder of the Turkish kingdom ; and even the savage Yuracaris of Brazil tell of their divine hero Tiri, who was suckled by a jaguar" (p. 255).

The relation of morbid imagination to myth is peculiarly well instanced in the history of a wide-spread belief, extending through savage, barbaric, classic, Oriental, and mediæval life, and surviving to this day in European superstition. This belief, which may be conveniently called the doctrine of were-wolves, is that certain men, by natural gift or magic art, can turn for a time into ravening wild beasts.

The doctrine of were-wolves is substantially that of a temporary metempsychosis or metamorphosis. Now, it really occurs that, in various forms of mental disease, patients prowl shyly, long to bite and destroy mankind, and even fancy themselves transformed into wild

beasts. Belief in the possibility of such transformation may have been the very suggesting cause which led the patient to imagine it taking place in his own person. But at any rate such sane delusions do occur, and physicians apply to them the mythologic term of lycanthropy. The belief in men being were-wolves, man-tigers, and the like, may thus have the strong support of the very witnesses who believe themselves to be such creatures. Through the mass of ethnographic details relating to this subject there is manifest a remarkable uniformity of principle.

Among the non-Aryan indigenes of India, the tribes of the Garrow Hills describe as "transformation into a tiger" a kind of temporary madness, apparently of the nature of delirium tremens, in which the patient walks like a tiger, shunning society. The Khounds of Orissa say that some among them have the art of "mleepa," and by the aid of a god become "mleepa" tigers for the purpose of killing enemies, one of the man's four souls going out to animate the bestial form. Natural tigers, say the Khounds, kill game to benefit men, who find it half devoured and share it, whereas man-killing tigers are either incarnations of the wrathful earth-goddess, or they are transformed men. Thus, the notion of man-tigers serves, as similar notions do elsewhere, to account for the fact that certain individual wild beasts show a peculiar hostility to man. "Among the Ho of Singboom, it is related, as an example of similar belief, that a man named Mora saw his wife killed by a tiger, and followed the beast till it led him to the house of a man named Poosa. Telling Poosa's relatives what had occurred, they replied that they were aware that he had the power of becoming a tiger, and accordingly they brought him out bound, and Mora deliberately killed him. Inquisition being made by the authorities, the family deposed, in explanation of their belief, that Poosa had one night devoured an entire goat, roaring like a tiger while eating it, and that, on another occasion, he told his friends he had a longing to eat a particular bullock, and that very night that very bullock was killed and devoured by a tiger. Southeastern Asia is not less familiar with the idea of sorcerers turning into man-tigers and wandering after prey; thus the Jakuns of the Malay Peninsula believe that, when a man becomes a tiger to revenge himself on his enemies, the transformation happens just before he springs, and has been seen to take place" (pp. 279, 280).

The remainder of the first volume, and by far the greater part of the second, is taken up with the subject of "Animism," on which Mr. Tylor's views have been already given in this JOURNAL. We shall, therefore, proceed to his chapter on "Rites and Ceremonies."

The purposes of religious rites, especially prayer and sacrifice, are first considered, the latter being traced from the original gift-theory into the homage-theory and the abnegation-theory, which is based on the idea that "the gist of sacrifice is rather in the worshipper giving something precious to himself, than in the deity receiving benefit."

Unequivocal examples of abnegation in sacrifice may be best found among those offerings of which the value to the offerer utterly exceeds the value they can be supposed to have to the deity. The most striking of these, found among nations somewhat advanced in general culture, appear in the history of human sacrifice among Semitic nations. The King of Moab, when the battle was too sore for him, offered up his eldest son for a burnt-offering in the wall. The Phœnicians sacrificed their dearest children to propitiate the angry gods; they enhanced their value by choosing them of noble families, and there was not wanting among them even the utmost proof that the efficacy of the sacrifice lay in the sacrificer's grievous loss, for they must have for yearly sacrifice only-begotten sons of their parents. Heliogabalus brought the hideous Oriental rite into Italy, choosing for victims to his solar divinity high-born lads throughout the land. Of all such cases, the breaking of the sacred law of hospitality, by sacrificing the guest to Jupiter Hospitalis, shows in the strongest light in Semitic regions how the value to the offerer might become the measure of acceptableness to the god. In such ways, slightly within the range of the lower culture, but strongly in the religion of the higher nations, the transition from the gift-theory to the abnegation-theory seems to have come about. Our language displays it in a word, if we do but compare the sense of presentation which "sacrificium" had in a Roman temple, with the sense of giving up and loss which "sacrifice" conveys in an English market (vol. ii., p. 361).

Numerous illustrations are then given of different nations attempting to diminish the cost without interfering with the efficacy of the sacrifice, as for example, when they eat the flesh and give the entrails or bones to the deity, or when a life has to be given for a life, substituting one of inferior value, as that of a criminal or a slave. The next step is the substitution of an animal for a human offering, and next to this the offering of merely an effigy. All these curious phases are fully illustrated by our author.

"If, now," he observes, "we look for the sacrificial idea within the range of modern Christendom, we shall find it in two ways not obscurely manifest. It survives in traditional folk-lore, and it holds a place in established religion. One of its most remarkable survivals may be

seen in Bulgaria, where sacrifice of live victims is to this day one of the accepted rites of the land. They sacrifice a lamb on St. George's day, telling, to account for the custom, a legend which combines the episodes of the offering of Isaac and the miracle of the three children. On the feast of the Panagia (Virgin Mary), sacrifices of lambs, kids, honey, wine, etc., are offered, in order that the children of the house may enjoy good health throughout the year. A little child divines, by touching one of the three saints' candles, to which the offering is to be dedicated; when the choice is thus made, the by-standers each drink a cup of wine, saying, 'Saint So-and-so, to thee is the offering.' Then they cut the throat of the lamb, or smother the bees, and in the evening the whole village assembles to eat the various sacrifices, and the men end the ceremony with the usual drunken-bout. In many another district of Europe, the tenacious memory of the tiller of the soil has kept up, in wondrous perfection, heirlooms from pre-Christian faiths. In Franconia, people will pour on the ground a libation before drinking; entering a forest, they will put offerings of bread and fruit on a stone, to avert the attacks of the demon of the woods, the 'bilberry-man;' the bakers will throw white rolls into the oven-flue for luck, and say, 'Here, devil, they are thine!' The Carinthian peasant will fodder the wind by setting up a dish of food in a tree before his house, and the fire by casting in lard and drippings, in order that gale and conflagration may not hurt him. At least up to the end of the last century, this most direct elemental sacrifice might be seen in Germany, at the midsummer festival in the most perfect form; some of the porridge from the table was thrown into the fire, and some into running water, some was buried in the earth, and some smeared on leaves and put on the chimney-top for the winds. France may be represented by the countrywoman's custom of beginning a meal by throwing down a spoonful of milk or *bouillon*; and by the record of the custom of Andrieux, in Dauphiny, where, at the solstice, the villagers went out upon the bridge when the sun rose, and offered him an omelet. The custom of burning alive the finest calf, to save a murrain-struck herd, had its last examples in Cornwall, in the present century; the records of heathen sacrifices in Scotland continued in the Highlands till within a century ago; and Scotchmen still living remember the corner of a field being left untilled for the goodman's croft (i. e., the devil's), but the principle of 'cheating the devil' was already in vogue, and the piece of land allotted was but a worthless scrap. It is a remnant of an old sacrificial rite, when the Swedes still take at Yule-tide a cake in the shape of a boar, representing the boar sacrificed of old to Freyr;

and Oxford to this day commemorates the same ancestral ceremony, when the boar's head is carried in to the Christmas feast at Queen's College, with its appointed carol, 'Caput apri defero, Reddens laudes Domino.' With a lingering recollection of the old libations, the German toper's saying still runs that heeltaps are a devil's offering" (pp. 369, 370).

After referring to the "presentation of ex-votos," a custom still largely prevailing in modern Europe, as an existing form of sacrificial rite, the author proceeds to the group of rites comprising fasting and other methods of producing ecstasy and other morbid exaltations for religious ends. He shows the universality of this custom in all regions and in all times of which we have any knowledge; and then goes on to discuss the use of narcotic drugs for inducing an ecstatic condition—such as the "cohoba," which Columbus described as being snuffed up the nostrils, the "curupa," which to this day is similarly used by tribes on the Amazons, the seeds of *Datura sanguinea* employed by the Darien Indians, the "tonca," drank in Peru, the seeds of "ololiubqui," used by the Mexican priests, etc., etc.

The posture of the dead in their graves, and the living in their temples—practices which may be placed under the general head of Orientation—are then considered and treated of in full detail; the author showing in his remarks on these subjects his great knowledge of the classical writers and the Christian Fathers.

The last group of rites he considers is that which "takes in the varied dramatic acts of ceremonial purification or lustration." After describing the varied forms in which the purification of the new-born child is accomplished in many of the lower races, he proceeds to the purification of the mother:

"The seclusion and lustration among North-American Indian tribes have been compared with those of the Levitical law, but the resemblance is not remarkably close, and belongs rather to a stage of civilization than to the ordinance of a particular nation. It is a good case of independent development in such customs, that the rite of putting out the fires and kindling "new fire" on the woman's return is common to the Iroquois and Sioux in North America, and the Basutos in South Africa. These latter have a well-marked rite of lustration by sprinkling, performed on girls at womanhood. The Hottentots considered mother and child unclean till they had been washed and smeared after the uncleanly native fashion. Lustrations with water were usual in West Africa. Tartar tribes in Mongolia used bathing, while in Siberia the custom of leaping over a fire answered the pur-

pose of purification. The Mautras of the Malay Peninsula have made the bathing of the mother after childbirth into a ceremonial ordinance. It is so among the indigenes of India, where both in northern and southern districts the naming of the child comes into connection with the purification of the mother, both ceremonies being performed on the same day. Without extending further this list of instances, it is sufficiently plain that we have before us the record of a practical custom becoming consecrated by traditional habit, and making its way into the range of religious ceremony" (vol. ii., p. 392).

Purification after contamination by bloodshed or touching a dead body, after confession of guilt, on attaining manhood or womanhood, and various lustrations connected with religious systems of different nations, are then considered, and virtually conclude this interesting and instructive work.

There is a final chapter; but it is merely a summary of the whole, in which the practical results of the study of primitive culture and its bearing upon intellectual, moral, social, and political philosophy are clearly and satisfactorily demonstrated.

Dr. Radcliffe's Nervous and Muscular Dynamics.

DR. RADCLIFFE'S views in regard to nervous and muscular action have been before the profession since 1851, when he published "*Philosophy of Vital Motion*." This was a production with which the author was far from satisfied. In 1864 appeared "*Lectures on Epilepsy, Pain, Paralysis, and Certain other Disorders of the Nervous System*." The present issue¹ is rather more than a second edition of the last. It has evidently been entirely rewritten, and, while retaining the general arrangement of the earlier publication, the author has more fully developed his theory, and brings better proof of its probability. All reference to therapeutics is omitted.

According to the views of the author, the sheaths of the fibres in muscle and nerve are non-conductors, and may act as dielectrics; hence, if there is a charge of either kind of electricity developed on the outer surface of the sheath, the inside takes by induction the opposite charge. Muscle being elastic and susceptible of elongation and contraction, the mutual attraction of these two opposite electrical charges causes an elongation of the muscular fibres, and, so long as the electrical condition is not disturbed, this elongation persists, and the muscle

¹ *Dynamics of Nerve and Muscle*. By Charles Bland Radcliffe, M. D., F. R. C. P. London: Macmillan & Co., 1871. Pp. 14 and 288.

is in a state of rest. When this electrical state of muscles, which may be compared to the charge of a Leyden jar, is disturbed, there is a discharge, as in the case of a Leyden jar; then, the mutual attraction of opposite electricities ceasing, the muscular fibres are allowed to contract. Hence the action of muscle is resolved into a succession of charges and discharges of microscopic anatomical Leyden jars.

These views depend for their proof chiefly upon the fact that the electrometer shows that there is during rest a supply of free electricity in living nerve and muscle; the surface made up of the sides of the fibres being charged positively, and the surface made up of either one of the two ends of the fibres being charged negatively, and the tension of these opposite charges rises as the distance increases from the line of junction between these surfaces. He considers the nerve and muscle *current* shown by the galvanometer during inaction to be purely accidental phenomena.

He mentions, as further proof of these views, that the muscle-current and nerve-current almost completely disappear when muscle and nerve pass from the state of rest into that of action, and there is at the same time an almost complete disappearance of all tensional signs of electricity; hence he concludes there is a discharge of electricity at that moment.

The fourth chapter is devoted to a consideration of the action of "inverse and direct" currents. "On passing a voltaic current along the leg of a frog from the foot upward to the other foot along the other leg downward, it is found—1. That the muscles contract at the moments of closing and opening the circuit, or at one of these moments singly; 2. That the muscles remain relaxed so long as the circuit is kept closed; 3. That the contractions continue for a longer time in the limb in which the current is upward or 'inverse' than in the limb in which it is downward or 'direct;' and 4. That by reversing the direction of the current the contraction may be more than once brought back in the latter limb after it has ceased, provided it have not then ceased in the former limb. There is a slight difference, whether the nerve is exposed or not, due to the act of the current, in one case expended chiefly upon the nerve and in the other upon the muscles."

The difference between the inverse and direct current he considers due to the fact that the former gives rise to a charge of positive electricity on the outsides of the muscular and nerve sheaths, thereby increasing the natural charge; whereas the direct current causes a charge of negative electricity which is the opposite of the natural charge.

The contraction at the moment of closing or opening the circuit is due to the extra currents which cause a discharge of electricity. The state of rest during the passage of the current is owing to the electrical charge, positive or negative, caused thereby.

In the fifth chapter is given the explanation of electrotonus, in accordance with the author's views of nerve-action. Electrotonus is not due to modifications of nerve-current from the action of the voltaic current upon the nerve, for electrotonus may be excited in other imperfect conductors, as a piece of string moistened with saliva or water.

Electrotonus is due to the accumulation of free electricity, which flows out beyond the limits of the circuit, the conductor being imperfect and not allowing all the electricity to pass freely. The positive electricity flows out beyond the anode, causing anelectrotonus; the negative beyond the cathode, causing catelectrotonus. In accordance with these views, may be explained the increased elongation and contraction of muscle found in electrotonus, and the increased irritability, the same being due to the condition of greater charge and of discharge, as in the case of the action of inverse and direct currents referred to in the previous chapter—in anelectrotonus the charge being positive, as in case of the inverse current; in catelectrotonus negative, as in the direct current.

Sensory nerves are affected similarly with motor nerves, through the extra current which passes in the same direction as the natural current, that is, exactly the reverse of the motor nerves.

The action of electricity in general, the voltaic, the franklinic, the faradaic, and that which is natural to the nerve and muscle as well, would seem to be resolvable into that of a charge and discharge of free electricity; each form of charge, the negative as well as the positive, but not to the same extent, keeping up the state of rest and impressibility, the discharge bringing about the state of action.

He thinks that the action of the blood on nerve and muscle may be to antagonize action by keeping up in muscle and motor nerve that state of charge in the fibres which is associated with muscular rest.

Chapter IX. is devoted to considering the action of nervous influence upon the muscles.

"The physiological history of convulsion would seem to show that muscular action in this case is connected, not with the presence, but with the absence of the nervous influence developed in the great nerve-centres by the action of the blood upon these centres."

"The fact, that muscles which are paralyzed, by cutting them off from the great nerve-centres, may be made to contract with greater

force than muscles which are not so paralyzed, would seem to show that contraction in this case is connected, not with the presence but with the absence, of nervous influence."

"The increased development of nervous influence in the great nerve-centres, consequent upon an increased supply of arterial blood to these centres, is not accompanied by involuntary muscular action."

"Instead of being a cause of muscular action, nervous influence would seem to have an actual power of antagonizing such action."

"Nervous influence may act upon muscle through the instrumentality of the natural electricity associated with it, producing rest and relaxation when present, because this presence implies a state of electrical charge, causing contraction when absent, because this absence (up to a certain point) is accompanied by a discharge analogous to that of the torpedo."

"The operation of nervous influence in the production of muscular action would seem to be altogether opposed to the notion that this action is brought about by the nervous influence acting as a stimulus to a vital property of irritability, inherent in living muscle."

The rhythmical action of the heart is explained by the presence of arterial blood in the ventricular walls generating fresh supply of nervous influence in the cardiac ganglia and so producing relaxation, diastole; contraction, systole, occurring when the charge of this arterial into venous blood causes a suspension of this influence, so there are alternate charge and discharge. The auricles are passively filled and emptied.

The action of blood-vessels, and the peristaltic motions of the intestines and respiratory movements, are also referred to the action of red and of dark blood.

Rigor mortis is referred to a cessation of the influence of arterial blood and of the nervous influence, and to the action of the physical elasticity of muscle-producing contraction; and it is not necessary to assume the existence of a vital property of tonicity in the muscles.

The nature of nervous action is considered in Chapter XIII. The influence of the blood upon the great nerve-centres develops nervous influence. Muscular action is connected with the absence of this influence. The presence of nervous influence, through the instrumentality of the natural electricity associated with it, produces rest and relaxation, because this presence implies a state of charge.

"The sensorial nerves may tell upon the sensorium in producing sensation of various kinds in the same way as that in which the motor nerves tell upon muscles in producing contraction; that is, by the

discharge, analogous to that of the torpedo, acting directly upon the part of the sensorium included in its circuit."

"The so-called stimuli which give rise to nervous action, the will itself not excepted, may act as the same causes have been seen to act upon muscle; that is, by disturbing the electric equilibrium which obtains during rest, so as to give rise to a discharge analogous to that of the torpedo."

"The dogma, that nervous action is the result of the awakening by some stimulus of a dormant vital property of irritability inherent in nerve, would seem to have no foundation in fact."

Part II. is devoted to a consideration of the subject from a pathological point of view. Muscular action in epilepsy and other forms of convulsion, in tremor and trembling, in tetanus, and other forms of spasm, and sensation as seen in neuralgia and allied disorders, are considered in their relations to the state of the respiratory and circulatory systems, and also to the state of the nervous system. His conclusion is, that pathology agrees with the physiological principles previously discussed.

The author has, with scrupulous care, distinguished between facts, well established in electro-physiology, and his own theories or conclusions, by using in the latter case the conditional or subjunctive mood. This has been carried to such an extent as to give the reasoning an air of uncertainty which in some cases it does not deserve.

The argument is ingenious, and the theory advanced is carefully considered, and is in accordance with the views, now generally accepted, that disease is deterioration. Pain, spasm, and convulsions, according to Dr. Radcliffe, are due to a weakened nerve-power, to decaying strength, to diminished vital energy. Therapeutic measures are now adopted in accordance with this idea, even by those who will reject the author's views.

Some points in physiology, as the cause of rhythmic action, of peristaltic action, the phenomena following galvanization of the pneumo-gastric, are explained as satisfactorily, perhaps, as they are under other theories.

The action of electricity in certain pathological conditions is explained, where other explanations are much less satisfactory or none is attempted. Thus it may be supposed that the favorable action of the galvanic current in certain cases of paralysis, where the faradaic is powerless, is due to the necessity of overcoming the abnormal *inertia* of the muscular fibres, and by long-continued action of the artificial charge to produce an elongation such as in the normal condition is

obtained by means of the natural electricity; then the discharge may cause contraction.

Again, the diminution of abnormal irritability under the use of the galvanic current may be explained by the presence of the charge of free electricity associated with electrotonus counteracting action by keeping the muscular fibres in a state of forced elongation.

Dr. Radcliffe seems to consider nervous influence and electricity identical. "I firmly believe that what is called electricity is only a one-sided aspect of a law which, when fully revealed, will be found to rule over organic as well as inorganic Nature—a law to the existence of which the instincts of philosophy and the discoveries of science alike bear testimony—a law which does not entomb life in matter, but which transfigures matter with a life which, when traced to its source, will prove only to be the effluence of the Divine Life."

Richardson's Discourses on Practical Physic.

DR. RICHARDSON'S three discourses on Practical Physic¹ were delivered on different occasions to audiences of medical men. They bear evidence of much thought and originality, and will abundantly repay a careful perusal.

In the first discourse, on Physical Disease from Mental Strain, the author urges the fact that most physicians study the diseases of the body from a point of view too exclusively physical; that they overlook or under-estimate the invisible agencies which through the mind affect the body for good or ill. It is not claimed that even hard mental work is productive of evil results, provided that work is carried on with evenness and order. The danger is shown to consist in extreme strain or shock. The various classes of mental workers are briefly referred to, and their special kind and degree of danger pointed out. The diseases resulting from shock or strain are divided into two classes: "There is a distinct class in which the mental shock stands out as the direct and only cause of the malady, and there is another class in which the mental shock or strain appears only to excite or exaggerate symptoms of disease which preëxisted. After alluding to these diseases somewhat in detail, the author says: "Respecting insanity, I doubt

¹Discourses on Practical Physic. I. On Physical Disease from Mental Strain. II. On Research in Medicine. III. On Intermittent Pulse and Palpitation. By Benjamin W. Richardson, M. A., M. D., F. R. S., Fellow of the Royal College of Surgeons, etc., etc. London: J. & A. Churchill, 1871.

whether it is ever the result of simple mental overstrain; on the contrary, I take it to be rather an upshot of extreme mental inactivity; but when the tendency to it is pronounced, then mental strain excites the malady." The object of the author throughout this discourse is simply to show the relation of mental to physical disease from a point of view the opposite of that usually selected in considering this subject. The author believes that "the origin of insanity, as a concrete fact, is rather to be sought for in inactivity, hereditary and individual inactivity of brain, than in exercise of brain; and that excessive exercise of brain is a cause not of mental, but of physical derangement." He says further: "Our uneducated, cloddish populations are, in short, as I venture to assume, the breeders of our abstract insanity, while our educated, ambitious, overstraining, untiring mental workers are the breeders and intensifiers of the worst types of physical disease." There is doubtless much truth in this view, but it seems to us that it should be somewhat modified by the consideration that a large proportion of the "cloddish" and uneducated class live and work in the open air, and have a decided advantage, as regards physical exercise and simplicity of habits, and hours of sleep, over those who occupy a higher position in the social scale. This may partially account for the comparative freedom of one class from physical ailments to which the other appears especially liable. It must be admitted, however, that mental inactivity is a condition fraught with more danger to the mind than the opposite one of constant activity. It is not obvious that mental toil, as such, is productive of so much physical disease as Dr. Richardson supposes, for some share of that disease must certainly be attributed to the surroundings and conditions pertaining to those occupations which are chiefly mental.

The second discourse is on Research in Medicine, and sets out with a statement of the extreme rarity of the proper frame or constitution of mind for the attainment of real eminence in medicine. "So rare is it, indeed, that the twenty-three centuries from the father of medicine have not brought forth twenty masters who at this moment are powerful to command." The author holds it easy for a man to become a great performer in surgery, to become crudite, to become a great theorist, and in these or many other ways to make his name known; but the mind that can attain real greatness in medicine must have one primary attribute, *impassion*, and must labor for no earthly object besides. Only such minds, so working, can advance medicine in the first principles of research. Medical science and art cannot be advanced by practice only. In regard to the order of research, the author believes uni-

ty to be the first principle that must be recognized. He ridicules the division that makes one man merely a pathologist, another a diagnostic, and a third a therapist. He says: "In the interests of science, in the interests of humanity, this centrifugal training and cultivation must really cease, if we, as a body, would stand a power; it is landing us breathless, companionless, naked, on the shores of folly, there to set up squalid huts and think ourselves kings." To a want of unity he attributes the very existence of quacks and quackery. "If we can make our science pure, there could be no quackery." Again: "We see that in astronomy there are no quacks, that among skilled artisans there are no quacks; and, turning to our own world, we know that even with us some parts of our field are entirely free of quacks. Who can find me a quack anatomist? Mark, as surgery has become more precise, how in surgery the quack has slunk aside!" In regard to uniting our forces the author considers it of the first importance to forbid, at once and for good, "the centrifugal mania of instituting a separate society for every artificially-divided branch of medicine. What should we say if the astronomers divided themselves into the telescopic society, the air-pump society, the solar society, the lunar society, the planetary society, the Saturn's-ring society, the asteroid society, the fixed-star society, the comet-and-meteor society, the star spectrum-analysis society, the world's-on-fire society, etc., etc?" It is admitted, however, that certain men are adapted to certain places in the world of medicine, and that the division of the art into medical and surgical is a natural and necessary one. It is also held allowable to divide physicians into those who treat physical and those who treat mental disease. "But, beyond these general divisions, there can be no rending for any thing but evil. Make diseases isolations, and you make them entities, to be treated as such." No very precise suggestions are given as to the means of securing that unity of research and unity of education deemed all-essential by Dr. Richardson for the future of medicine. We could wish he had been more explicit, especially in regard to education, but he is evidently very much in earnest, and his suggestions are well worthy of consideration.

The third discourse consists of a definition of intermittent pulse and palpitation. The author's investigations have satisfied him that intermittent pulse is not due to structural disease of the heart; nor is the cause to be sought in the cerebro-spinal system of nerves. He believes it to result from disordered action of the sympathetic system, which action may be consequent on shock from anxiety, from mental or physical fatigue, from grief, passion, or other causes. In other words, the

intermittency is due to a loss of power in the nervous centres which supply the reserve contractile impulse of the heart.

When intermittent pulse is not present in an aggravated degree, Dr. Richardson does not regard it as of dangerous significance; but, when persistently present, it does signify that the subject of it has less power for work, and especially less capacity to resist sudden demands upon the strength, or to contend against unexpected or unforeseen obstacles. "Persons in whom there is permanent intermittent action of the heart pass through all acute diseases with less chance of recovery than others of similar age and like constitution who have no cardiac failure."

In the treatment of this affection, the indications are to sustain the strength in anæmic patients by iron, quinine, and strychnia, to subdue nervous excitement by anodynes, to avoid all causes of emotional agitation, and to insist upon eight or nine hours' sleep out of the twenty-four. In extreme cases, marked relief is afforded by the judicious use of alcohol, in the form of ale, sherry, or good brandy. The author believes that a light meal taken an hour or two before bedtime is good, not only for persons suffering from intermittent pulse, but for all others as well. He says: "To retire to rest with the body fasting is as bad a practice as to retire to rest with the stomach busily digesting." In certain severe cases of intermittency, great relief has been given by the use of a blister applied over the whole front part of the neck, so as to influence the sympathetics; and the author suggests that irritation by the faradaic current might be applied with prospect of a good result. The same remedies, or rather palliatives, that are useful in intermittent pulse, are recommended in cases of palpitation.

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- I.—*A Treatise on Localized Electrization and its Applications to Pathology and Therapeutics.* By Dr. G. B. DUCHENNE. Translated from the third edition of the Original. By HERBERT TIBBITS, M.D., etc. With numerous Illustrations, and Notes and Additions by the Translator. Philadelphia: Lindsay & Blakiston, 1871. 8vo, pp. 322.

THE first part of this very valuable work is all that has yet appeared in its English dress. It is devoted entirely to the description of electrical apparatus and to the discussion of general principles, and should be in the hands of every physician.

- II.—*On the Use of the Ophthalmoscope in Diseases of the Nervous System and of the Kidneys ; also in certain other General Disorders.* By T. CLIFFORD ALLBUTT, M. A., M. D., Cantab., etc. London and New York : Macmillan & Co., 1871. 8vo, pp. 405.

AN admirable treatise on a subject of vast importance, by a very competent observer. The work will be reviewed in the next number of the JOURNAL.

- III.—*The Change of Life in Health and Disease. A Practical Treatise on the Nervous and other Affections incidental to Women at the Decline of Life.* By EDWARD JOHN TILT, M. D. From the third London edition. Philadelphia : Lindsay & Blakiston, 1871. 8vo, pp. 287.

FULL of information useful to every physician.

- IV.—*Emergencies and how to treat them. The Etiology, Pathology, and Treatment of the Accidents, Diseases, and Cases of Poisoning, which demand Prompt Action. Designed for Students and Practitioners of Medicine.* By JOSEPH W. HOWE, M. D., Visiting-Surgeon to Charity Hospital, etc. New York : D. Appleton & Co., 1871. 8vo, pp. 265. •

THE best work of the kind with which we are acquainted.

- V.—*The Physician's Dose and Symptom Book, containing the Doses and Uses of all the Principal Articles of the Materia Medica and Officinal Preparations, etc.* By JOSEPH H. WYTHES, A. M., M. D., etc. Tenth edition. Philadelphia : Lindsay & Blakiston, 1871. 16mo, pp. 277.

INACCURATE and incomplete.

- VI.—*Headaches : their Causes, and their Cure.* By HENRY G. WRIGHT, M. D., etc. From the fourth London edition. Philadelphia : Lindsay & Blakiston, 1871. 12mo, pp. 154.

AN excellent little book, but somewhat behind the times.

- VII.—*Restorative Medicine : an Harveian Annual Oration delivered at the Royal College of Physicians, London, on June 21, 1871 (the two hundred and tenth Anniversary).* By THOMAS KING CHAMBERS, M. D., etc. With Two Sequels. Philadelphia : Henry C. Lea, 1871. 12mo, pp. 85.

GOOD, like every thing else from Dr. Chambers.

- VIII.—*The Management of Infancy, Physiological and Moral : intended chiefly for the Use of Parents.* By ANDREW COMBE, M. D. Revised and edited by Sir JAMES CLARK, Bart., K. C. B., M. D., F. R. S., Physician-in-Ordinary to the Queen. First American, from the tenth London edition. New York : D. Appleton & Co., 1871. 12mo, pp. 302.

- IX.—*The Functions and Diseases of the Reproductive Organs in Childhood, Youth, Adult Age, and Advanced Age.* By WILLIAM ACTON, M. R. C. S., etc. Third American, from the fifth London edition. Philadelphia: Lindsay & Blakiston, 1871. 8vo, pp. 348.

WELL written, thorough, and decent.

- X.—*The Relations of Epilepsy to Insanity and Jurisprudence.* By J. W. CONKLIN, M. D., Assistant Physician to the Southern Ohio Lunatic Asylum. 12mo, pp. 43.

AN essay showing considerable research, and expressing, in the main, correct views on an important subject.

- XI.—*Eating and Drinking: a Popular Manual of Food and Diet in Health and Disease.* By GEORGE M. BEARD, M. D. New York: G. P. Putnam & Sons, 1871. 12mo, pp. 180.

A good, practical manual, but fanciful in some respects.

- XII.—*Chemistry: General, Medical, and Pharmaceutical, including the Chemistry of the U. S. Pharmacopœia, etc.* By JOHN ATT-FIELD, Ph. D., F. C. S., etc. From the second and enlarged English edition. Revised by the Author. Philadelphia: Henry C. Lea, 1871. 12mo, pp. 552.

THE best work of the kind in the English language.

- XIII.—*The Medical Jurisprudence of Insanity.* By J. H. BALFOUR BROWNE, Esq. London: J. & A. Churchill, 1871. 8vo, pp. 341.

A REHASH of Ray's work. Review in next number of the JOURNAL.

- XIV.—*Hand-Book of Skin-Diseases.* By Dr. ISIDOR NEUMANN. Translated from the second German edition, with Notes by LUCIUS D. BULKLEY, A. M., M. D., etc. Illustrated with sixty-six Woodcuts. New York: D. Appleton & Co., 1871. 8vo, pp. 467.

REVIEW in next number of the JOURNAL.

- XV.—*The Druggist's General Receipt-Book, comprising a Copious Veterinary Formulary, etc.* By HENRY BEASLEY. Seventh American edition. Philadelphia: Lindsay & Blakiston, 1871. 8vo, pp. 497.

USEFUL to almost everybody.

- XVI.—*Neuralgia, and the Diseases that resemble it.* By FRANCIS E. ANSTIE, M. D. (London), etc. New York: D. Appleton & Co., 1872. 12mo, pp. 362.

A CAPITAL treatise, which will be fully reviewed in the next number of the JOURNAL.

XVII.—*On the Treatment of Pulmonary Consumption by Hygiene, Climate, and Medicine, in its Connection with Modern Doctrines.* By JAMES HENRY BENNET, M. D., etc. Second edition. New York: D. Appleton & Co., 1871. 8vo, pp. 190..

ABOUNDING in valuable suggestions from an author who has experienced, in his own person, the truth of much of what he expresses.

XVIII.—*A Text-Book of Pathological Histology; an Introduction to the Study of Pathological Anatomy.* By Dr. EDWARD RIND-
FLEISCH. Translated from the second German edition, with permission of the author, by WILLIAM C. KLOMAN, M. D. Assisted by F. T. MILLS, M. D. With two hundred and eight illustrations. Philadelphia: Lindsay & Blakiston, 1872. 8vo, pp. 695.

AN exceedingly valuable treatise, well translated. Review in next number of the JOURNAL.

XIX.—*Mental Diseases, or Diseases of the Brain and Nerves; developing the Origin and Philosophy of Mania, Insanity, and Crime, with Full Directions for their Treatment and Cure.* By the Author of "The Physician," "Harbinger of Health," etc., etc. [ANDREW JACKSON DAVIS]. Special edition. New York: American News Co., 1871. 12mo, pp. 487.

BOSH!

CHRONICLE.

I.

LETTER FROM GEORGE E. DAY, M. D., F. R. S., LATE PROFESSOR
OF MEDICINE IN THE UNIVERSITY OF ST. ANDREWS.

IN my last letter I referred to the sudden outbreak of spiritualism that followed the publication of Mr. Crooke's first paper on "Psychic Force." The general interest in the subject is by no means unabated; but, as I venture to think that I can more profitably fill the space that is kindly allotted me in the pages of this JOURNAL by the consideration of more profitable matters, I will content myself with remarking that Mr. Crookes has published a second paper on his Psychic Force, with additional and apparently most carefully-conducted experiments; that the long-promised report of the London Dialectical Society's committee, "to investigate the phenomena alleged to be spiritual manifestations," has just appeared, in a large octavo volume; that an elaborate criticism of spiritualism and its claims appears in the October number of the *Quarterly Review* (written, it is believed, by Dr. Carpenter); and that a Prof. Zerffi has brought out a little book entitled "Spiritualism and Animal Magnetism," having the same object as Dr. Hammond's work, but in all respects inferior to it.

In the hope that the editor of this JOURNAL will undertake the labor of examining and reporting on the bulky volume emanating from the labors of the Dialectical Society, I will content myself with stating that, from the reports of six sub-committees (one of which, No. 4, remarks that "nothing occurred in presence of this committee worth recording;" another, No. 5, reports that Mr. Home failed at all the *séances*, to exhibit his powers of levitation; while a third, No. 6, declares that they obtained no manifestations), the general committee conclude: 1. That sounds of a very varied character apparently proceeding from articles of furniture, the floor and walls of the room—the vibrations accompanying which sounds are often distinctly perceptible to the touch—occur, without being produced by muscular action or mechanical contrivance. 2. That movements of heavy bodies take place without mechanical contrivance of any kind or adequate exertion of muscular force by the persons present, and frequently without contact or connection with any person. 3. That these sounds and movements often occur at the times and in the manner asked for by persons present, and, by means of a simple code of signals, answer questions and spell out coherent communications. 4. That the answers and communications thus obtained are for the most part of a commonplace character; but facts are sometimes correctly given which are only known to one of the persons present. 5. That the circumstances under which the phenomena occur are variable, the most prominent fact being, that the presence of certain persons seems necessary to their occurrence, and that of others generally adverse; but this difference does not appear to depend upon any belief or disbelief concerning the phenomena. 6. That, nevertheless, the occurrence of the phenomena is not insured by the presence or absence of such persons respectively. But immediately after the reports of the committees comes a remarkable statement from the chairman of the general committee, who tells us, not only that his eyes "have been a little opened by some of the manifestations which it has been his duty to witness," but that he feels bound, both on his own part and on account of other dissentients, to record the conviction that "the framing of the report, and the selection, publication, and reviewing of the evidence have practically drifted into the hands of devoted and zealous spiritualists, who are led by skilled and successful writers."

Dr. Maudsley, the distinguished Professor of Medical Jurisprudence in University College, and the President (for this year) of the Medico-Psychological Association, has just published the address which he delivered at the meeting held in August at the Royal College of Physicians. The general subject which he discusses is on "Insanity and its Treatment," while the special topics that he considers are:

1. *The prevention of insanity.*
2. *The treatment of insanity in asylums and in private houses.*
3. *The use and abuse of sedatives in the treatment of insanity.*

1. The prevention of insanity is considered under two aspects: First, in relation to the propagation of insanity from one generation to another; and, secondly, in relation to the prevention of insanity in the individual who has inherited a predisposition to it. In reference

to the first of these aspects, he asks, "Are we scientifically justified in declaring authoritatively to any person, on the ground of bad ancestral influences, that he ought to abstain from marriage, and resolve to be himself the last of his line?" To this question he replies that, "at the first blush it might seem plain that we ought to forbid any one so situated to have children!" but he adds various reasons why such law should not be made absolute.

In the first place, it is impossible to determine what ancestral influences are of so baneful a character as rightly to preclude an individual from continuing his species. The son of an epileptic may be more likely to become insane than the son of a person who has been actually insane. In like manner, neuralgia or other forms of nervous disease in the parent may manifest itself in the offspring in the form of a tendency to insanity; and, as a matter of experience, we know that if we meet in practice with a case of violent neuralgia, occurring from time to time in an obscure way, without our being able to assign any morbid cause for it, we may predicate the existence of insanity in the family with almost as much confidence as if our patient were actually insane. Now, if all persons in whose families there was the history of some nervous disease were placed under the ban of a compulsory continence, or at any rate were debarred from marriage, it is clear that there would be some danger of unepeopling the world.

Secondly, if we did know the ancestral history, there are several varieties of the insane neurosis, however caused, which differ much in degree, and therefore in danger. There are individuals marking every step in the gradation between the mildest form of the insane temperament and downright idiocy. Who, then, can undertake to fix upon a certain point in this gradation, and to declare with the authority of science that hitherto and no farther it shall be lawful and right to procreate children?

The third reason which he offers is the most weighty of all, for while those just adduced may lose, this will gain force with the progress of science. Let it be supposed certain that a person will have children, one or more of whom will go mad, it might still happen that the world would gain more by one of the children who did not, than it would lose by those who did, go mad. In that case, would not his marriage, grievous as its consequences might be to individuals, be amply justified by the good done to the race? If one man of genius were produced at the cost of one thousand, nay, at the cost of fifty thousand insane persons, the result might be a sufficient compensation for the terrible cost. Are we not apt to think too much of the numbers and too little of the value of individuals?

Be this so or not, I have long had a suspicion, which experience is strengthening into a conviction, that mankind is indebted for much of its originality and for certain special forms of genius to individuals who themselves, or whose parents, have sprung from families in which there has been some predisposition to insanity. They often take up the by-paths of thought, which have been overlooked by more stable intellects, and, following them persistently, discover new relations of things; or they display special talents or energies which they discharge in

originalities, or perhaps even eccentricities of action ; inspired, too, with singular faith, they are reckless of obstacles that would have daunted energy less enthusiastic. And the world is notably the gainer by their existence. This impulse of originality is truly a sort of inspiration, which comes not by reflection, which, indeed, a man cannot acquire if he have it not naturally ; and, perhaps, it was in a recognition of this fact that was engendered the old superstitious notion that the insane were divinely inspired.

However this be, let it be distinctly understood, and ever borne in mind, in estimating the influence of hereditary action upon the individual, that there is not merely a law of hereditary transmission by which a child inherits the qualities of its progenitors, but that there is also a law of variety whereby it comes to pass that no child exactly resembles either parent, or, so far as we know, any one of its ancestors. There is a law of *invention* as well as a law of *imitation*, too much overlooked hitherto by writers on hereditary disease, which sometimes evinces its operation in a remarkable manner in families that have a taint of insanity, and so leads to the display of originality. Add to the action of this law of invention or variety the action of another well-known law, by which a diseased organism strives, as it were, to return to a healthy type, not only in the individual but through generations, and so occasions a tendency in disease to die out, unless freshly lighted up, and it will be sufficiently evident that hereditary action in disease is very far from having matters all its own way.

If these speculations be well founded, it is clear that, to forbid the marriage of a person sprung from an insanely-disposed family, might be to deprive the world of singular talent or genius, and so be an irreparable injury to the race of man. It would be something like the custom which has prevailed among certain nations—to kill their weakly and deformed children ; thus carrying into conscious operation the law of natural selection by which the unfittest perish, and the fittest survive, in the struggle for existence. While we know so little as we do of the laws of human production, it certainly would be unwarrantable to interfere in that way with the production of mankind, and for a like reason I cannot think science yet has the right to forbid marriage to those in whom some tendency to insanity exists.

"Is the case" (asks Dr. Maudsley) "the same, however, for a man or woman who has once had an attack of insanity? Should a person who has been so unfortunate as to lose his reason for a time, ever marry?" The probability that the children in such a case would have strong predisposition to insanity is assuredly very great, while it is not likely that they would have talent or genius.

"It is a fact of observation that a child born after an attack of parental insanity is more likely to be afflicted with the disease than one born before the attack. The strict application of the rule would, of course, prevent a woman who had once suffered from puerperal insanity from having children afterward. Are we prepared, then, to make this stringent application of it? For my part, I should hesitate to do so, and should prefer, in giving an opinion, to consider each case on its merits, especially as many instances occur in which women who have

suffered at one confinement have had several children afterward, and have not suffered similarly again. One may justly use the strongest words of dissuasion to restrain a person who has once been insane from marrying, but how much farther than that one is justified in going does not seem at all clear, and I should be glad to elicit the opinion of those present and the reasons for the opinions."

I now pass on to the consideration of the second aspect in which he considers the "Prevention of Insanity," viz., its prevention in those who are predisposed to it. To this subject he devotes five or six pages, and I can only give one or two short extracts, showing the hopeful view which he takes:

"A person who is so unfortunate as to have inherited a predisposition to insanity is not necessarily a helpless victim of fate or destiny; he has, or might have, a certain power over himself to prevent insanity, human will counting for something, not only in the modification of physical nature, but in the modification of a man's own nature. But the will can only be developed by exercise; cannot be fashioned suddenly and through reflection only; must be a slow and gradual growth through action in relation to the circumstances of life. Just, in fact, as he gains, by practice, a particular power over the muscles of his body, associating them in action for the performance of complicated acts, which, without previous training, he could no more perform than he could fly, and rendering his muscles, in this regard, habitually obedient to the dictates of his will; so can he, in like manner, gain by practice a particular power over the thoughts and feelings of his mind, associating them in action for the definite accomplishment of a definite aim in life, and rendering them, in this regard, habitually obedient to the dictates of the will in the pursuit of its ideal. The right scientific advice to any one who has inherited a predisposition to insanity is, to strive before all things to develop his will, and, at any rate, not to allow him to believe that prayer—if by prayer he hears, as is too often heard, merely a formal or sentimental invocation for help from on high, and not the sincere and earnest expression of all the energies of the heart and mind—can compensate for lack of will in the conduct of life."

"In the capability of self-formation which a man has, if it be only rightly developed, there lies a great power over himself to prevent insanity. Perhaps not many persons need go mad—at any rate, from moral causes—if they only knew the resources of their nature and resolved systematically to develop them. We, who have practical experience of the insane, know well what a power of self-control they sometimes evince when they have a sufficient motive to exercise it. The fear of suffering by yielding to their insane propensities suffices in many instances to hold them in check; the occasional concealment or actual denial of his delusions by an insane person, if he has something to fear from the discovery of them, or something to gain by the concealment of them, testifies to a power over himself which a sane person might sometimes envy. It is, indeed, in consequence of this power of self-control, and of the way in which those who have the care of them elicit it, that asylums have become quiet and orderly institutions, instead of being, as formerly, dens of disorder and violence.

Now, if the power exists in the insane mind in such degree as to prevent the manifestations of madness, is it not reasonable to suppose that, if properly trained and exercised originally, it might have sufficed to prevent its occurrence? The pity of the matter is, that it is often least developed where it is most wanted."

II. I now proceed to the second of these topics, viz., "The Treatment of Insanity in Asylums and in Private Houses." In opposition to the view generally adopted, Dr. Maudsley boldly maintains the two following propositions:

"The first is, that not many persons recover in asylums who might not recover equally well out of them; and the second is, that the removal of an insane patient from the asylum sometimes directly conduces to his recovery.

"At the outset it must be admitted that there are certain cases of insanity which cannot be treated satisfactorily out of asylums. But this is not because there is any special virtue in asylum treatment; not because any special medical or moral treatment is applied there which could not be applied in a private house; but it is because there are in a well-organized asylum efficient means of exercising proper care and control where great care and watchfulness are necessary to prevent the patient doing harm to himself or to others. The cost, too, of treating a patient in a private house is so great as frequently to leave no resource but the asylum; pauper patients must necessarily go there on that account; and, inasmuch as insanity is a disease which commonly lasts weeks or months before recovery takes place, those who are in moderately good circumstances find the continued expense a burden which they can ill afford to bear. But where there are the necessary means for securing good attendance and proper medical supervision, my experience leads me to think that in comparatively few cases is it absolutely necessary to send the patients to asylums; and, if such a measure can be avoided, there are, of course, cogent reasons for avoiding it."

After quoting various cases, including two of acute mania with much excitement and violence, in which the patients recovered admirably from the results of private treatment, he suggests the intermediate course of having licensed houses for receiving two or three patients, efficient supervision being of course exercised. At present a license is scarcely ever granted for merely two patients. The establishment of a registry for good and trustworthy attendants is also recommended.

With regard to the second proposition, he feels assured that in some cases the removal of a patient from even a first-rate asylum is not unfrequently the salvation of his reason. He gives four illustrative cases, of which I quote one by way of example:

"Some years ago I saw in consultation a young gentleman in a private asylum, who had been sent there in consequence of a severe attack of acute, violent mania. When I saw him, the excitement had passed off, but he was not well, though he spoke sensibly. He heard voices reproaching or reviling him, and was addicted to doing impulsive and perverse acts of folly, or sometimes of violence. In this state he had remained for some time. The question was, whether he was likely to

get well or not, and whether any change could be made in his treatment with advantage. The medical man of the asylum expressed an opinion that he was dangerous, and not fit to be at large; and for my part I could not see reason to expect much benefit from his removal to private care. Nevertheless, a relative was most anxious to try a change, and, fortified by my opinion that he might do so without serious risk, insisted on his removal from the asylum. The result was, that he went on well from that time, and has remained well ever since."

Such cases as these certainly prove that recovery is in some instances promoted by the removal of the patient from an asylum. The confinement, the monotony, the lack of interest and occupation, the absence of family relations, which are inevitable in an asylum, especially in men of the better classes, do, after a certain time in some cases, more than counterbalance the benefit of the seclusion. The patient has no proper outlet for his energies, and an outlet is made for them in maniacal excitement and perverse conduct; he goes through recurrent attacks of that kind, and finally sinks into a state of chronic insanity—becomes an asylum-made lunatic.

III. With the last of his topics—"The Use and Abuse of Sedatives in the Treatment of Insanity"—I have no space to deal, which I regret the less, as this subject was fully discussed by various distinguished physicians at the close of the reading of the address. The following quotations will give an idea of his views on that point:

"I certainly must protest against the assertion that we have in the hydrate of chloral a drug which never fails to procure sleep, and never does harm, and which has rendered other drugs almost unnecessary in the treatment of insanity. It sometimes fails entirely to produce sleep, or subdue excitement for a time, and the patient shows no evidence of being any the better for it afterward. Without committing myself to any fixed rule, where I am still only gaining experience, my present feeling is to reserve chloral as much as possible for use at bedtime, and to give none at all during the day. I am certainly opposed to the practice of giving a dose of the drug every three or four hours, which some medical men adopt now, as they formerly adopted the practice of giving opium in the same way.

"The question which I want to have considered is—whether the putting the nerve-cells of the patient's brain into chemical restraint, so to speak, does really benefit them? It is quite possible that a patient's appetite may improve, that his temperature may fall, and that his weight may increase, without his mind improving. These things may happen with patients as they become demented; and I should like to ask Dr. Clouston whether he feels quite sure that his experiments, for nine consecutive months, with bromide of potassium and cannabis Indica have not helped his patients down-hill, and burdened the rates of Cumberland and Westmoreland with some incurable lunatics. One fact, however, I must mention in conclusion, although it tells somewhat against my argument—that I have quite recently treated a case of acute and violent mania in a man with cannabis Indica and bromide of potassium, as recommended by Dr. Clouston, with the best possible results: he recovered in a week, when there was every

probability that the disease might have lasted for weeks, or even longer. While glancing, then, critically at the experiments, I cannot conclude without expressing a deep sense of their value, and a hearty wish that we had many more like them."

I need hardly say that Dr. Maudsley's thoughtful and eloquent, though somewhat paradoxical address, excited more attention and discussion than usual. Among the chief speakers were Drs. Bucknill, Davey, Arlidge, Thurnam, Rogers, Clouston, Wood, Monro, Christie, and Yellowlees—all men of mark; while Dr. Blandford, who was unable to be present, but by Dr. Maudsley's kindness was allowed to read the address, has contributed a paper upon it to the same number of the *Journal of Mental Science* (October, 1871), in which the address itself appears.

As the President's avowed object was to excite discussion, I give a few very brief quotations from some of the speeches that were made. Dr. Bucknill started the ball. Passing over his remarks on the hereditary propagation of insanity, I will take up his observations upon the second aspect under which the first topic is considered: "With regard to your proposition that there is a certain diathesis which runs through the children of the insane, but which may not produce insanity, I think nothing is more true, nothing is more consonant with experience, but it is one of the most difficult and interesting scientific questions connected with our specialty as to what this insane diathesis is—what this inheritance of a peculiar nervous temperament which produces insanity in one child, epilepsy in another, wildness and unmanageable misconduct in another, idiocy in another, hysteria in another. What is this mysterious diathesis? If you could only get at that, we might get at some rational notions as to how the children of the insane should best be educated and trained, or best be taught how to resist their tendencies. I remember reading a very little book in the series of books called 'Little Books on Large Subjects,' called the 'Power of the Individual over Himself to prevent Insanity;' and the more I live and observe the insane, the more certain I am that a great number of individuals have an enormous power over themselves in this respect, if they can only be taught to exert it. With regard to your second subject, I have only to observe that I do not agree with you in thinking that lunatics can be cured out of asylums so well as in them. I do think that, for most cases of insanity, the order, the method, the power, the whole of the means which can be brought to bear upon curative efforts in asylums, are most valuable; and, I should say, that if a person were afflicted with acute and recent mania, he would have, on the average, a much greater chance of being cured in an asylum than if he were placed under the most scientific treatment out of one. I fully admit, however, that patients may be kept in asylums too long, and that it is not necessary to keep them there until they are actually and perfectly recovered."

From Dr. Davey's speech I extract the following quotation on the therapeutics of insanity: "With regard to the use and abuse of sedatives, no fact is more impressed upon my mind than that of the abuse of opiates and of chloral. Nothing is more certain than that these

drugs are sometimes resorted to when they ought of all things to be avoided. Is it not in the experience of all here present that with some patients the very best sedative is a powerful purgative? The necessity of elimination—using the word as our President has used it—should be ever uppermost in our minds. I am continually treating cases, with which I could do nothing if I did not act on this principle. Dr. Monro, I am glad to observe, has noticed in his book on insanity that the *primæ viæ* are almost invariably out of order in some shape or other. How can you remove this derangement of function if you put away the use of purgatives? They may be used moderately, sometimes less moderately, but always judiciously. Then they will in many cases be found to be the very best sedatives. And now, too, does it occur to you all, as it does occur to me, to give tonics with strychnine? That preparation of sulphate of iron, quinine, and strychnine, I find sometimes the best sedative in the world. The strychnine effects a constriction or contraction of the cerebral vessels, a state of things which occurs in natural sleep; and thus you will be making the very best step forward to afford your patient sleep. Who does not know, also, that air and exercise are of the first importance in the treatment of insanity. Where there is much excitement, put your patient into a garden, or let him take a walk; or, if he is in a country asylum, put a spade in his hand and let him work. Every case, as I have said before, must rest on its own merits; but I do not unconditionally condemn the use of opium. I have in my mind at this moment a case of melancholia which resisted every form of treatment, but was at length cured by the free use of opium. She got perfectly cured, care being taken to regulate the diet, and to maintain the *primæ viæ* in the normal state."

Passing over the excellent speeches of Drs. Arlidge and Rogers, and the earlier part of Dr. Clouston's observations, I shall give the last-named physician's views on the question of sedatives. "In regard," he observes, "to the third head of Dr. Maudsley's discourse—the use of sedatives in insanity—I think that most men who have gone largely into the subject have come to this conclusion, that insanity and brain excitement are precisely equivalent to neuralgic pain. I think no physician outside scruples for one moment to subdue a severe attack of tic in a patient. The patient might lose in weight, or be rather the worse for it, but it is so very desirable to get rid of the state of pain that he subdues the pain even at the risk of hurting the patient. What we want to subdue neuralgic pain is some sedative or neurotic medicine which will subdue the pain without interfering with the normal nutrition of the nervous system, and that is the desideratum in regard to the use of sedatives—do they hurt patients? do they send them on the road to death? If they do not, and at the same time quiet excitement, I think we are quite entitled to assume that they do well. If we find that a patient is going down-hill, then the patient's life is the first thing, and we must not sacrifice that, or do any thing which interferes with his health. But, if we do not do this, then we may subdue excitement by any sort of sedative that is proper to the case. That seems to me about the problem we have to solve.

I have been very much struck, indeed, with the extreme divergence of opinion among able men who have used different kinds of sedatives for the same class of cases, and who have used them apparently conscientiously, but who have come to totally opposite conclusions with regard to their effects."

From Dr. Monro's speech, which abounds in sound, practical suggestions, I make a couple of very short quotations, dealing with the asylum and the sedative questions :

"I believe it would be a most important thing if we could combine what I have called the sense of restraint and the sense of a necessity of the patient's controlling himself, with some of the affections of home-life. And now I am not speaking of a thing which I have not practised myself, for the last year or two I have been in the habit of receiving sisters and brothers, and mothers, sane people, as boarders in my asylum. At the present moment I have three or four such at my asylum, and I wish to impress upon this most important Association the great advantage which I have seen arise from that mode of practice. I would urge upon gentlemen connected with the practice among the higher, especially, to think of what I have said regarding having individual members of the family, servants of the family, governesses, and people of that sort, as boarders in their institutions. I fully grant that at first there is a difficulty in the subject. In the first place, it a little upsets all the management of the asylum to have a number of eyes all around you, looking out for the slightest offence—sane eyes; but I believe that this is one of the great advantages of having sane boarders in the asylum. It keeps all the servants, all the officers, everybody, up to the mark in a most wonderful way. To sum up what I have said, I believe asylums to be absolutely requisite, especially for the poor, and for certain forms of insanity. Now about the question of sedatives. I do not know what Dr. Maudsley said, but I feel strongly against sedatives. I fully grant what Dr. Wood has said, that we must not take up any general rule and refuse sedatives altogether, but what we want to allay chiefly is excitement; and certainly I have seen opium and morphia too often increase the excitement instead of allaying it. As to chloral, I think it has a wonderful effect where it succeeds. It makes a patient sleep for four-hours, but it does not do much more."

I shall conclude my remarks on Dr. Maudsley's address and the speeches which it evoked, with an extract from Dr. Blandford's observations, to which I have already alluded :

"In my published lectures, the various drugs mentioned as sedatives, are mentioned in connection with the question of sleep, not the stifling of excitement. With few exceptions they should be given at night, and at night only; but now and then a case may be seen where it is a question of sleep or death for the patient—and we must try to bring about sleep, whether by night or day, for we cannot wait twenty-four hours till night comes round again, when this period of time may make the difference of living or sinking to the delirious sufferer. It is true that these very acute cases are preëminently those in which sedatives are most apt to fail. Formerly, such patients were treated

with opium and morphia, which, in the majority of instances, I venture to say, did harm rather than good. Next, bromide of potassium was brought to bear upon them, and the effect of this was not great; for bromide is not directly a sleep-compelling agent, though it often occasions drowsiness in those that take it. Nowadays chloral would be almost certainly administered by medical men. Dr. Maudsley speaks disparagingly of chloral, and elsewhere we read of deaths and untoward symptoms brought about by its administration. Whether the samples of the drug vary considerably, or whether its too-frequent administration may lead to unpleasant result, I know not, but, in the course of a tolerably large administration of it to many patients, I can affirm that I have never had five minutes' uneasiness on account of any dose I have ever ordered, and beyond all question its power of producing sleep, both in acute and chronic insanity, exceeds any thing that would have been believed ten years ago. We cannot refrain from attempting, at any rate, to procure sleep in these extreme cases of sleepless delirium. If drugs are of no avail, especially chloral, we may trust to other measures, but we can hardly stand by and see this sleepless delirium day after day, without trying to do something to arrest it. I believe that here chloral judiciously given does not act as a poison, like morphia, and that we may at any rate give it a trial without fear. In my lectures, 'I have never seen a cold-bath given, but I should like to see the effect of placing a patient in a tepid bath and allowing him to remain there till the water cooled.' Since this was written, we have seen Dr. Wilson Fox's¹ account of the treatment of acute disease — acute rheumatism—by means of cold-baths, and of the way in which patients were snatched from an almost moribund condition by this method. In these days of thermometers, when the temperature can be so carefully noted, I wish that those who practise amid the numerous patients, and are provided with the various appliances of our large asylums, would give this treatment a trial."

Dr. Mitchell, one of the Commissioners in Lunacy, for Scotland, has commenced the publication, in the *Edinburgh Medical Journal*, of a series of papers "On Certain Points of Practical and Scientific Importance in Connection with Insanity and its Treatment." The first paper is "On the Principles which have determined the Classification of Mental Diseases," in which he exhibits the leading classifications that have been up to the present time propounded. Commencing with Pinel, Dr. Mitchell observes, with regard to his classification of mental diseases into 1. Melancholia; 2. Mania; 3. Dementia; and 4. Idiotism, that it rests on the character of the existing mental phenomena, or in other words, "on the idea that insanity was a lesion of the understanding itself, and not a corporeal lesion, of which the disorder of the understanding was a mere consequence or symptom." From Pinel's work, which was published about eighty years ago, he proceeds to another work, published so recently as the year 1869, and also a work of authority, namely, "The Nomenclature of Diseases," drawn up by a

¹ This subject is noticed in a later part of this letter. Dr. Fox's researches are now published in a separate form by Messrs. Macmillan & Co.

joint committee appointed by the Royal College of Physicians of London.

In this work insanity is properly included under diseases of the nervous system, which are in four great divisions: 1. Diseases of the brain and its membranes; 2. Diseases of the spinal cord and its membranes; 3. Diseases of the nerves; and 4. Disorders of the intellect. It will be observed that the committee speak of *diseases* of the brain, *diseases* of the spinal cord, and *diseases* of the nerves, but of *disorders* of the intellect. What they understood to be the difference between diseases and disorders is not stated, and the use of the word *disorders* in reference to the intellect has probably been adopted as some sort of acknowledgment that it was felt to be scarcely correct to talk of diseases of the intellect; but no way of wholly avoiding it appears to have been seen.

When we turn to the divisions of the sub-class disorders of the intellect, we find very little change from Pinel's time, for they consist of—1. Mania; 2. Melancholia; 3. Dementia; 4. Idiocy and Imbecility; and 5. Paralysis of the Insane. In other words, they are still divided into disorder of the intellect with depression, disorder of the intellect with excitement, disorder of the intellect with feebleness or loss, and congenital absence of intellect. To these, however, is curiously added, as a separate division, *the general paralysis of the insane*—a disease whose very name indicates that it manifests itself by physical as well as by psychical signs, or that it is a disorder of the body as well as of the mind. Except for this anomalous interjection, this classification of mental diseases is substantially, if not identically, the same as that of Pinel. It is certainly determined by the character of the mental phenomena, and constitutes depression, excitement, and loss or absence of intellect into different diseases, or at least into different forms of disorder of the intellect.

If, therefore, we are to judge by the latest authorized nomenclature of diseases, matters are still very much where Pinel left them, as regards the classification of mental diseases.

Any such conclusion, however, would be a mistake, for many writers have shown great uneasiness in accepting this old classification, and other classifications have at various times been proposed.

These efforts to introduce a better classification have been made in two directions. Of the one, the mental phenomena under a different aspect continue to afford the basis. But the other tries to link these phenomena to the bodily diseases which give rise to them.

Dr. Mitchell now proceeds to give one or two illustrations of the first:

"Esquirol" (he observes) "for example, changed the classification of his master by the addition of monomania, and by giving to dementia and idiocy the meanings which we now give them, making the first indicate deprivation, and the second privation of the intellectual faculties.

"Prichard, again, divided all mental diseases into two classes: those in which the understanding or rational powers are affected, and those in which the moral or active principles are disordered; in other words, into intellectual and moral insanity.

"Dr. Bucknill thought that insanity might be intellectual, emotional, or volitional; but his fellow-worker, Dr. Daniel Tuke, thought a sound metaphysical division would be into disorders of the mind involving—1. The intellect; 2. The moral sentiments; or 3. The propensities; but he ended by adopting a division into idiocy, dementia, delusional insanity, emotional insanity, and mania.

"Perhaps the most ingenious of all those classifications, which are founded on the mental symptoms, is that adopted by Dr. Maudsley, in his work on the 'Physiology and Pathology of the Mind.' In his later work, entitled 'Body and Mind,' he appears to have somewhat modified his opinions; but, when he wrote the work referred to, he regarded the different varieties of mental disease as falling naturally into two great divisions: 1. Affective insanity, including moral and impulsive insanity; and 2. Ideational insanity, which might be either partial or general.

"It will at once be seen that these classifications differ from that of Pinel, and the London College of Physicians, in this, that, although they still have the mental phenomena as their basis, they make the different forms of insanity depend on the different parts or faculties of the mind which are involved in disorder, and not simply on the exhibition of excitement, depression, or defect in the mental state. So far, therefore, this is the introduction of a new principle—to this extent at least, that it is another way of looking at the mental system as a basis of classification.

"Such efforts, however, to improve the classification of mental diseases have not produced any thing very useful or novel; and it stands as a fact that Pinel's old division is not yet dethroned, being that recommended about a couple of years ago by the College of Physicians, and that which is still practically adopted all over the country."

Dr. Mitchell next goes on to illustrate the second direction which has been taken in the efforts made to improve the nosology of mental diseases—that, namely, which grounds the classification on the bodily diseases which give rise to insanity; and he then proceeds to notice the systems of Morel and Schroeder Van der Kolk.

First, as regards Morel. He thought that mental diseases arranged themselves in six groups, viz.: 1. Hereditary insanity; 2. Toxic insanity; 3. Insanity determined by neurotic affections, like epilepsy, chorea, etc.; 4. Idiopathic insanity; 5. Sympathetic insanity; and, 6. Dementia.

It will be instantly seen that this classification is not based on the mental symptoms—either like Pinel's, with reference to manifestations of excitement, depression, or loss; or like Prichard's, or Bucknill's, with reference to the particular faculties of the mind which exhibit disorder. On the contrary, it affects to rest chiefly on the nature of the predisposing and exciting causes; and Morel endeavored to show that similar causes generally produce similar mental derangements, so that hereditary insanity, for instance, becomes to some extent recognizable by the character of the mental phenomena a patient exhibits, as well as by his family history. In applying his classification, however, it is found that his first and fourth groups—hereditary and idio-

pathic insanity—are somewhat conveniently elastic, and are easily made to include any cases which do not readily fall into the other groups; while, in those other groups, we find cases with a right to be regarded as hereditary, which it would be very difficult indeed to dispute. Then his last class, dementia, is altogether out of harmony with the others, being determined solely by the character of the mental symptoms, and being, in fact, simply a class made up of patients drafted into it from the other divisions in the concluding stage of their disorder.

Schroeder Van der Kolk, again, feeling that every classification must be unsatisfactory which proceeded more from the morbid symptoms than from the nature and origin of the disease, reduced the different forms of insanity to two groups, which, he thought, served all considerations in a therapeutical point of view. The first group he called Idiopathic Insanity, because in it the brain suffers primarily. The second group he called Sympathetic Insanity, because in it the brain suffers secondarily. In this classification, therefore, every form of insanity is regarded as due to some bodily disease; but the defect of the system, as he carried it out, was, that sympathetic insanity, by long continuance, might, and in a large number of cases did, become idiopathic insanity; in other words, after the psychical function of the brain had been long deranged by the irritating influence of some distant bodily disease, such structural changes might be induced in the brain as would then make the insanity directly due to them, and no longer a mere secondary or sympathetic disturbance of its psychical functions. This classification, like Morel's, had one great convenience: every case which could not be shown to be sympathetic was easily classed as idiopathic.

Schroeder Van der Kolk looked on mania, melancholia, and dementia, solely as symptoms—as nothing but different kinds of mental confusion and defect; and his classification, though imperfect and objectionable, is the expression of a desire to get nearer to the root of the matter by keeping the insanity in close association with its pathological origin.

At an international congress of physicians engaged in the treatment of insanity, which met at Paris, in 1867, a classification was proposed more or less on the principles which guided Morel and Van der Kolk; but it wants homogeneousness, and exhibits evidence of many compromises, that is, being made up of fragments of the various systems which the different members of the congress advocated, and it is not probable that it will ever be adopted. It consists of a division of mental diseases into—1. Simple Insanity; 2. Epileptic Insanity; 3. Paralytic Insanity; 4. Senile Dementia; 5. Organic Dementia; 6. Idiocy; and 7. Cretinism.

One more effort to classify mental diseases still remains to be noticed; and it is the boldest and best which has been made in recent times. It was first propounded by Dr. Skae, in his presidential address to the Medico-Psychological Association, in 1863.

Dr. Skae starts with the proposition that we ought to classify the varieties of insanity according to their natural history, which he calls

a rational and practical basis. He shows that, in the actual presence of the insane, book-learning about mania, melancholia, emotional insanity, volitional insanity, and such other reputed forms of mental disease, is misty, disappointing, and all but useless; and he reminds us that, whenever we are required to direct the treatment or predict the issue of a particular case, we invariably find ourselves making minute inquiries into its history, with the object of fixing the relations of the mental symptoms to some bodily state or bodily disease. Is it associated with parturition? we ask ourselves, with the arrival of puberty, or the cessation of the menses; with prolonged lactation; with hard drinking, with epilepsy, paralysis, or chorea; with phthisis, syphilis, or rheumatism? In such circumstances, he says, these are the points we find ourselves investigating. If we stopped with determining that the mental action showed excitement, or showed depression, there would be no feeling that we had determined any thing that was likely to be useful. In other words, we instinctively endeavor to classify in our minds, for practical purposes, all cases of insanity according to their natural history or origin.

This, I think, is briefly Dr. Skae's position—a classification based on the bodily disease, of which the mental phenomena are merely signs. His experience led him to propose twenty-seven groups. I shall not occupy time by naming them; but when I say that they include epileptic insanity, insanity of pubescence, climacteric insanity, general paralysis, delirium tremens, hysterical mania, puerperal mania, mania of lactation, traumatic mania, etc., their general character will at once be understood, and it will be seen that each division derives its character from the originating or accompanying bodily state.

Idiopathic insanity appears as the twenty-seventh, or last, in the list; and it serves in this classification a convenient purpose, as it does in others. Cases which cannot be referred to any of the other twenty-six groups find a place in the twenty-seventh. The more, however, that insanity is studied from this point of view, the fewer will the cases be which are thus classed as idiopathic.

In many of these groups the mental manifestations are understood to be distinctive, as well as the so-called natural history. "For instance, in general paralysis, delirium tremens, uteromania, climacteric insanity, phthisical insanity, etc., there are mental phenomena which may safely be described as of tolerably steady occurrence, and which are at least sufficiently distinctive when they present themselves, to suggest our looking for sexual excess, or hard drinking, or irritable ovary, or phthisis, as the case may be, in the patient's history. If this were broadly true of all the groups, it would of course be a point of the very highest scientific interest and practical value. It appears to me, however, to be sufficiently true to raise pleasing hopes as to the extent which our knowledge of the nature of healthy and unhealthy mental operations may yet attain."

Having thus explained the *three* leading principles which have served as a basis of the different classifications of mental diseases, he proceeds to discuss more generally their respective values. I have no space to follow him here, and will merely observe that he maintains

that the medical mind is generally tending to some modification of Dr. Skae's system. With regard to the future, he remarks that the first effect of further investigations will probably be greatly to increase the twenty-seven groups of Dr. Skae; but there will then begin a grouping the groups, as some common pathological origin is detected; and in the end, I believe, we shall get to a very much smaller number than that with which we may be said to have started. And, as we do this, we shall, in all probability, be at the same time reaching a classification which will more and more correctly admit of being described as resting on pathology.

Even then, however, we may find it useful and convenient to talk of diseases of the mind—of disorders of the intellect—of the physiology and pathology of the mind—of mania, melancholia, and dementia; but we shall know exactly what we mean by such terms, and we shall not be misled by them. We do not now speak of diseases of the sight, but of diseases of the eye; it will be a long time, however, before we are in a comparable position as regards insanity. In the mean time, good work, in a right direction, is being done, and insanity has the hope of becoming, more correctly and fully than it ever has been, a part of medical science. The only secure foundation of the therapeutics of mental diseases, as well as of their classification, lies in a knowledge of their nature and origin. The less we know of this, the feebler is the art of healing. Feeble it is at the best, but, the more of such knowledge we have, the stronger grows our ability to avert and cure. To get at that knowledge is admittedly difficult, for the altered mode of action of the mental faculties is often the only sign of disease in the insane. It may be so prominent as to mask the corporeal disease to which it is due, and the general health of the patient may appear to be good. The connection between bodily, or cerebral and mental states, is often most obscured; the result perhaps, in many instances, of our imperfect knowledge of the functions of the different parts of the brain.

In his second communication, entitled "Syphilitic Insanity illustrated—the Influence of the Body on the Mind, and the Mind upon the Body," Dr. Mitchell begins by showing that "we have not *one* form, but *various* forms of disordered action in the muscles due to eccentric irritation, or, in other words, that we have sympathetic, reflex, or eccentric epilepsy, tetanus, and chorea." He then proceeds to show that we have also different kinds of mental as we have different kinds of muscular disturbance, resulting from eccentric irritations in the body. "We have in mania and fatuity something like the analogues of convulsions and paralysis, and we have them arising from similar causes. This, in short, is what is meant when we speak of sympathetic or reflex insanity." He very ingeniously illustrates his views by noticing the phenomena of laughter as it occurs in infancy and more advanced life and as it is evoked either mentally or mechanically. There are two points to which he specially calls attention. One is this: Are not some provoked to laughter, much more easily than others, by such things as tickling the sole of the foot or the armpit? And if so, how do these differences occur, and what meaning have they? The

other point is: What would happen if the tickling were persisted in, or in other words, if this irritation of the peripheral nerves were kept up? "I have," he says, "no facts enabling me give a definite answer to this; yet I think I am justified in asserting that the effects might be serious. I am sure that no prudent man would sanction the prolonged or persistent tickling of a young child. In adults the laughter cannot so readily be kept up as in children; but in them it can be sufficiently prolonged to cause the pleasurable feelings to give place to feelings of discomfort, distress, or even pain, which feelings are not then referred to the foot but to the head, and they may end in tears and sobs—a totally new and opposed set of phenomena. We may safely assume that changes of nutrition will occur in those parts of the nervous centres which are excited into such lively action, if it be prolonged; and that the functions of such parts will thereby be modified, while other parts may at the same time be called into abnormal action. In ordinary circumstances the laughter will cease or become feeble as soon as it begins thus to act injuriously. And whenever it ceases there will of course be the commencement of a return everywhere to the normal state—a return which will be safely and quickly accomplished, provided that the departure has not been great, and that there were not previously weak points in the nervous centres requiring only some unusual action to induce in them a serious derangement." He adds in a note that Rausius Texter, who was, I believe, a French writer, who flourished in the beginning of the sixteenth century, gives a list of persons who died laughing, but he seems to doubt whether laughter ever causes death. I have seen it stated that prolonged tickling of the soles of the feet is employed as a torture by the Chinese, the victim at length dying from exhaustion; and I have a vague recollection of hearing, some forty or fifty years ago, of a man being tried for murder by tickling three wives to death, but whether the story was based on fact I do not know.

Having shown how a trifling eccentric irritation may cause grave lesions of mind and body, he now proceeds to the consideration of cases of insanity due to similar causes:

"The most notable, perhaps, of these sympathetic insanities are those in which the eccentric irritation lies in the colon. Esquirol seems to have suspected that this was a prolific cause of insanity, but the subject has been more fully discussed by Schroeder Van der Kolk than by any other writer; and I shall state, as briefly as I can, what is known regarding it.

"First, then, what are the mental phenomena which present themselves, and have they any distinctive character? The answer to this is that, in the insanity which comes from this source, there is almost invariably a depressed or melancholic state of mind; but, more than this, the depression has certain characters which tend to distinguish it from depressions due to other causes. The mental phenomena of course differ more or less in every case, but they show a sufficient sameness to be fairly regarded as distinctive.

"In melancholic persons, then, whose mental disorder proceeds from some eccentric irritation in the colon, along with the general

feelings of depression, sadness, and gloom, there are engrossing self-accusations of wickedness and baseness either in the present or in some past time. They persistently calumniate themselves. They regard their fits of sadness as qualms of conscience. They have rendered their relations or friends miserable, or have plunged them into poverty. They have been cheaters, speculators, and have used money which did not belong to them. They have shown a wicked want of affection toward parents, wives, or children; they are the cause of other people's sorrows, sufferings, and losses, and are waiting to be punished; they must not eat, because they have wasted their money, and have none left to pay for food; they have deservedly fallen under contempt, and so on. In short, they are depressed and sad, and they say they are so because conscience is awakened in them to a sense of their great wickedness, and they are accordingly loud and unceasing in their self-accusations.

"Frequently these mental symptoms, in a mild form, are found to have existed for a greater or less length of time before the patient comes under the notice and care of a physician. And in this early stage he may show a control over his distressing feelings, and be able to conceal them from all but his most intimate friends.

"So much for the *mental* signs. As regards the *bodily*, there may be a good appetite, but it is generally bad, with a foul breath, and food is sometimes altogether refused. The hands and feet are cold, and the pulse small and contracted. There is sleeplessness—sometimes almost complete. Even when such patients sleep after going to bed, they waken early, and in the morning their state is generally one of greater misery and wretchedness than toward evening; as, indeed, is the case with most melancholics. In not a few instances, pressure on the upper part of the neck causes an unpleasant feeling in the head. Lastly, there is in every case marked constipation, and in most cases this long precedes the mental derangement.

"This constipation is associated with various stages in the colon. The descending colon is believed to be the suffering part in the first instance. Constrictions or narrowings occur in it, of a spasmodic or organic nature, either above or immediately below the sigmoid flexure. When below it, the flexure itself is distended with gas, and widened, lengthened, and often pushed up to the transverse colon. When above the flexure, then the transverse colon is distended, widened, and lengthened, so as often to fall down to the pelvis. These changes and displacements may in some cases involve both the descending and transverse colon, but the narrowings or constrictions have not been observed either in the ascending or transverse parts of the gut. At the seat of these narrowings the coats of the colon may be thickened, but in the other parts they are thinned and stretched. Its mucous membrane generally has a healthy look, but in some instances ulcerations occur.

"It is Van der Kolk's opinion that in most cases these displacements and elongations of the colon have arisen through previous spasmodic contractions and strictures of the left portion, and that constipation in the first instance leads to these, which in their turn

mechanically increase the constipation. And so the gut just above the stricture becomes filled with hardened fecal masses, while the rest of the gut, back even to the cæcum, is more or less permanently distended with gas. The presence of these fecal masses at the seat of the constriction is supposed to cause the irritation, which acts sympathetically and injuriously on the brain, and gives rise there to the peculiar morbid action which has been described.

"It must not be supposed that any one holds that insanity will appear in every instance, or even in the majority of instances, in which such conditions as have been described occur in the colon. We know the reverse to be the fact. Where it does follow, there must have been in all probability some predisposition or particular excitability of the nervous system. As tetanus may be induced by a wound in a person predisposed to the disease, while in others a similar wound would be harmless, so it is here.

"We find: 1. That these affections of the colon are exceptionally common in the insane; 2. That those of them in whom they are found generally display certain mental phenomena; 3. That, reversing it, where the characteristic mental manifestations occur, we frequently find the local affections; and, 4. That, when the treatment of such patients is directed by these views, it is often successful.

"A gentleman some time ago called on a physician and stated that he was laboring under great depression of spirits, at once adding that his condition could be explained, for he had been guilty of the most abominable wickednesses, for which his conscience was troubled. During the whole interview he kept accusing himself of crimes which he had never committed, and said that he deserved and expected some terrible punishment, and that life was becoming unendurable. He said that he had been unhappy for a considerable time, but that of late his misery had been greatly increased. He was unable to give any attention to business, so engrossing and overpowering were his distressing thoughts. He was sleepless, his tongue and breath were foul, and he said that he was and had long been extremely constipated.

"An aperient was ordered, which he said acted well, but he was not relieved in mind. The aperient was ordered again next day, and again acted well, but with little relief to his distress. A third aperient was given, and there followed a very copious discharge from the bowels of hardened fecal masses. Immediate and almost complete relief of the mental symptoms followed this, and there was no return.

"The fair inference here is, that the view which directed the treatment of the patient was sound. It is probable that in this case the feculent mass was just above the sigmoid flexure, and that it was perforated or tubular, allowing the passage of the matters which followed the first two aperients.

"It must not be expected, however, that we shall often have a good result so quickly or satisfactory as in this case; for, where the sympathetic irritation of the brain has lasted for any great length of time, its nutrition will have been so well affected, and such changes will have occurred in it, that we cannot look for an immediate relief, when the eccentric irritation, which has really originated the mischief,

is withdrawn. We shall, in fact, very frequently find that the change in the brain has become permanent, and quite beyond all aid from the art of medicine. The cerebral injuries resulting from eccentric irritations in the colon, of which we have been speaking, are of a very grave character. But there is an unhealthy action of the mind, of a minor, less marked, and less serious character, which results from the same or similar causes, and which is frequently seen. I refer to the condition of the mind which so commonly attends what we call an overloaded state of the bowels—constipation, in other words. It is probably within the personal experience of many of my readers, that obstinate constipation causes them to be irritable, depressed, dissatisfied with themselves, and incapable of seeing any but the dark side of events. Now, this is nothing but a minor manifestation of what has just been described as insanity or melancholia. In their nature, and scientifically, the two states are the same. They have the same origin, and are removed by the same means. In both, the distant local irritation influences cerebral action in exactly the same way, whatever that may be.

“The mental phenomena, in these minor sympathetic disturbances, are quite of the same character as those found in the major: they are both states of depression and self-dissatisfaction. This is a valuable fact, and goes to support the views we have been expressing; for, if we admit the actuality and sufficiency of the cause in the milder mental disturbance, we can scarcely refuse to do so in the graver.

“It is interesting, again, to find the tolerably steady production of a definable class of mental phenomena by a definable local irritation, occurring in a region and organ far away from the brain, and to general observation, unconnected with it. A loaded rectum or colon does not produce hilarity and laughter, and tickling the sole of the foot does not produce sadness and gloom. Can we reflect on these things, and not feel that there may be something under them of which our philosophy hath not yet dreamed; and that every approach to a knowledge of that something will be an increase of human happiness; and that no higher study could possibly engage the attention?

“There is another aspect from which we may fairly regard the depressed states of mind which are at times produced by affections of the colon. It is this: If we call up these feelings of depression by mental or moral agencies, is there any region of the body in which we feel discomfort? When we have a real qualm of conscience, is it not attended with some bodily uneasiness, and where is that situated? Not in the limbs, not in the back, or the head, but in the region of the stomach or transverse colon. This is matter of common observation and experience. And it is surely instructive and interesting, if true, to find that irritation in a particular region of the body is felt when a similar mental state is called into existence by moral causes.

“When disordered cerebral action, due to sympathy, has lasted for a long time—and, if the sympathetic disorder be active, the time will not be very long—the nutrition of the brain is so interfered with as to produce changes in it which we may call structural. Then the removal of the irritation will not remove the insanity, which in fact

has ceased to be sympathetic, and has become due to disease in the brain itself. I have pointed this out already, but I do so again in order to state that, when such structural or other change has taken place, the mental symptoms may, and probably will, change considerably, and they may eventually lose all that was characteristic about them in the early stage of the malady, when they depended on a functional sympathy of the brain with some distant bodily disturbance."

The views of Van der Kolk, referred to by Dr. Mitchell, may be found in his "Pathology and Therapeutics of Mental Diseases," published after his death by his pupil, Dr. F. A. Hartsen, translated into German by Dr. Theile, and retranslated into English by Mr. Rudall, a distinguished surgeon in Melbourne, Victoria. As the translation was published in 1869, a notice of it does not fall within the scope of these letters. I may, however, be permitted to observe that it is favorably received in the current number of the *British and Foreign Medico-Chirurgical Review*, and that it is well worthy of careful study.

I now resume the consideration of Dr. Laycock's lectures, beginning with the fifth, which is headed, "A Clinical Trophic and Vaso-Motor Anatomy of the Brain and Cord, from a New Point of View." Like his preceding lectures, it is extremely difficult to analyze, and I can do little more than thread together the most essential paragraphs. In a former lecture he explained the general rules to be observed so as best to ascertain the changes in the brain and nervous system which constitute the predisposing, exciting, and proximate causes of neuroses in *general*. "When, however" (he observes), "we have to consider those of *special* nerve-centres, it is necessary to determine at least two things, viz., the seat of the trophic changes in the nerve-cells and nerve-fibrils, and the relation of vaso-motor action to these changes. As to the nature of the trophic and dynamic changes, I need only remind you of this—that no anatomical research, however minute and microscopic, whether conducted in living or in dead tissue, can reveal to us these molecular changes upon which the varying functions of the nerve-centres depend. All we can say positively of these, as of molecular chemical changes is, that there are such changes, and that each kind must occur in its own proper portion of the nervous system, in accordance with the functions of that portion, and according to fixed laws. All visible structural changes in nerve-tissue are coarse diseases, and coincide with destruction or abolition of function. They indicate the result of trophic disorder, often of long standing, but not the causes of the disorder itself.

"In respect to the vaso-motor activity of these nerve-centres, we know more—but little that is positive and practical.

"We have not determined the vaso-motor relations of the nerve-centres to each other; anatomical and physiological have failed as to the most fundamental centres—the sympathetic ganglia; so that our ignorance of their functions is generally admitted. When we turn more especially to those ganglia which regulate the activity of the blood-vessels that supply the encephalon—viz., the cervical ganglia—we have not only to deal with the carotid and vertebral systems, but with that of the thyroid body and its relations to the functions of the

brain and spinal cord. Looking at these relations from the anatomical and vaso-motor points of view, we cannot avoid the conclusion that the thyroid body has more complex trophic functions than is generally suspected. This is shown by its twofold blood and nerve supply. The *nervi molles* (so called) are the branches of the system of the superior cervical ganglion which accompany the superior thyroideal artery as a limb of that system, whereas the inferior thyroideal artery belongs to the system of the vertebral arteries, and receives nerve-fibrils from its own ganglion, the middle cervical. We may reasonably conclude, therefore, that, as the innervation and arterial supply of the thyroid body are double, the functions are double. That these functions are in connection with those of the other cervical ganglia, is probable from the intricate anatomical relations of the whole chain; these are so close that the thyroideal ganglion is sometimes integrated (an important fact) with the lower cervical, while it has commissural connections, not only with the superior cervical above, but with the cardiac ganglion below. Now, no one, so far as I know, except myself, has called attention to the clinical relations of these facts to goitre and cretinism, to vascular bronchocele, and 'Graves's disease,' and to the functions of the ovaria and uterus."

After a few remarks on the general complaints that so little is known, practically, of the pathology of the sympathetic system, Dr. Laycock proceeds as follows:

"According to vaso-motor theories, the cervical sympathetic ganglia should regulate the encephalic circulation; consequently, in encephalic neuroses, like epilepsy, and its serious accompaniments of morbid brain-nutrition, leading to insanity and dementia in fevers with delirium, and in insanity in general, the pathological anatomy of these centres should elucidate the pathology; yet, how little of this is known! They have been found red and swollen in a few cases of death from hydrophobia and from typhus; but of their state in insanity, epilepsy, hysteria, and various vaso-motor affections of its encephalic tissues, the circulation within which is supposed to be regulated by these ganglia, we have few, if any, observations. The cause of this neglect is not far to seek; it is the chaotic conflict of views as to the anatomy and physiology of the sympathetic system. Feeling strongly these difficulties, I have lately adopted a new method of observation of this great group of encephalic neuroses, which certainly helps to simplify bedside work, and to clear up numerous doubtful and embarrassing problems. I shall, therefore, explain it to you. To this end I will first, however, explain the guiding principles of the method:

"It is generally yet erroneously thought, in accordance with scientific terms, that the nerves 'arise' and are developed from the nerve-centres, and the arteries from the heart and large vessels. Hence the numerous discussions as to the 'origin' of the sympathetic, and of the 'roots' of various nerves both spinal and encephalic. Now, in the development of the embryo the nerves are formed independently of the nerve-centres, and the arteries appear before and act independently of the heart, so that the evolution of the vascular system, with its accompanying nerves, is not like that of the branches of a tree

from a common trunk, but like that of a river from a number of rills, or like that of veins. The function of the central ganglia is to unify trophic changes in tissues and the actions of the vessels and of their accompanying nerves; but these changes and actions can and do go on independently of either heart or nerve-centres. If we go a step further and inquire to what uses vessels and nerves are subservient, we learn at once that they subserve to cell-function, and that cells can be grouped together, each group having distinct functions to perform in the body politic. My late friend and colleague, Prof. Goodeir, first promulgated the doctrine—afterward confirmed by Virchow—that not only is the entire organism composed of simple or developed cells, each having an independent vitality, but that there is also a grouping of cells into departments around one capital or central cell. A common and striking example of this kind is the primordial cell of the ovum.

“Guided by these facts, I take an area of blood-supply as indicative of an area of cells and tissues in functional and trophic relation with each other, and with a common source of blood and of regulative *vis nervosa*, both vaso-motor and trophic. These areas may be marked out in the encephalic tissue, and as special centres of functional cell-activity, in two ways, viz., by the descriptive and pathological anatomy of the arteries, and by the observed functional and trophic changes in the corresponding areas of blood-supply; only, instead of looking at the arterial trunks as they give off branches, we must consider them as made up of branches. I think Serres was the first to show, in his ‘Anatomie Comparée du Cerveaux,’ published in 1824, that the development of the encephalic nerve-centres is dependent on the development of the arteries, and that the nerves, whether sympathetic, spinal, or encephalic, grow as it were toward the nerve-centres with which they are finally connected. Since, as the areas become more and more comprehensive, a larger blood-supply is needed, and more regulative *vis nervosa* required, it follows that with an increased extent of central control the arteries get larger and the nerves thicker; so that each important trunk or branch of nerve and of artery may be held to indicate a centric trophic area. Guided, therefore, by this principle, I have divided the cerebro-spinal axis into distinct yet mutually dependent arterial areas, each presumably with its sympathetic ganglia, its commissural connections, its correlative cranial and other structural developments, and its sphere of physiological and pathological changes in organs and tissues. The method is so wholly new that it is as yet imperfectly developed; you will, however, find these arterial cerebro-spinal areas set forth in a tentative way in psychological text-book, ‘Mind and Brain,’ vol. ii., p. 473, *et seq.*

“We will now see how far they will help us to a knowledge of the relations of the encephalic vaso-motor or trophic centres to neurotic diseases of tissues, both within and without the cranium.

Serres lays down two laws of development of the central nervous system—viz., the law of symmetry or of symmetrical halves, and the law of conjugation or of integration of the two halves of the nervous system into one organ. The cerebellum, for example, is fundamen-

tally double—a lateral leaflet coming from each restiform body, representing in fishes that which in man constitutes the hemispheres. The median lobe (or superior vermiform process) is developed in relation with the tubercula quadrigemina. The arterial development follows the same laws. On each side there are symmetrical arteries, and where there is conjugation of nerve-centres we find conjugation of arteries either by integration or by anastomosis of the trunks. When the centres are distinctly ganglionic, united by commissural nerve-fibrils, we shall have arterial trunks united by anastomosing arteries; but when the two symmetrical halves combine, both by commissure and ganglion, there may be union of the arterial trunks of each half, either by complete integration into one trunk or by a cross-anastomosing branch; so that anastomosis and integration of arteries, and *vice versa*, represent commissural union of nerve-centres in relation to them. The aorta is thus constituted out of two lateral vessels. It has, therefore, a corresponding ganglionic and commissural centre somewhere in the cord or the encephalon. The integration of the two vertebral arteries into the basilar artery at the lower border of the pons Varolii, and in exact accordance with its length, indicates that the pons is the commissural centre of those groups of cells to which the blood is distributed thence. This great vascular area is in functional relation, therefore, with the most complete commissural centre of the encephalon and its dependencies—the ‘vital knot,’ as the French anatomists, with much propriety, term it. Nor is this coincident unity of arteries and development of correlative trophic centres a solitary fact, as we shall soon see, but a general law. After the union of the two vertebrals with the basilar artery, two subordinate areas of innervation in connection with the pons are marked out by two distinct sets of branches from the basilar. One of these includes the cerebellar arteries, and supplies the cerebellum, pons varolii, medulla oblongata, and the upper portion of the spinal cord. This cerebellar vascular area is further divisible into two areas, supplied by the posterior and anterior cerebellar arteries respectively. Of these, the posterior is that which corresponds with the commissural connections of the cerebellum with the cord; for, although often found to be given off from the basilar, it is not unfrequently a branch of the vertebral artery on one side, and of the basilar on the other. These two cerebellar vascular areas indicate, therefore, a group of different nerve-centres, which may be referred to the two commissural vermiform processes; for, while the posterior or cerebello-spinal artery is ultimately distributed to—which means in development that it primarily arises in—the inferior vermiform process and the sides of the median fissure, and the inferior surface of the cerebellum, the superior cerebellar artery supplies the superior vermiform process (median lobe), the velum interpositum, and the valve of Vieussens. A small branch arises in the internal auditory meatus, and this seems to correspond to that branch of the auditory nerve which has been traced to the cerebellum. Tinnitus aurium and spectral voices thus acquire a diagnostic significance as to the state of the circulation in cases of brain-disease of this occipito-spinal region. A few branches go to—i. e., in development

come from—the under-surface of the sphenoidal lobe, thus connecting this cerebellar branch with the function of that lobe.

“To understand clearly, however, the important clinical relations of these areas to epilepsy and insanity commencing therein, we must include the blood-supply of the basilar region of the cerebrum and of the ganglionic centres situate therein. We know little of the functions of several of these; but so much is certain, that they appear early in the scale of development, and are obviously in essential connection with the corporeal centres proper. The two posterior cerebral arteries of the basilar area, as well as with the basilar area, indicate the bond of union. They supply blood to the inferior surface of the posterior lobe, to the crura cerebri, tuber cinerium, and corpora albicantia, while a choroid branch connects the velum interpositum and tubercula quadrigemina with the basilar area, as well as with the vascular choroid plexus. All these encephalic nerve-centres and tissues are therefore within this great occipito-spinal and corporeal area of which vaso-motor activity of the vertebral arteries is the clew. Their vaso-motor connection with the vascular areas supplied by the internal carotid system is indicated by the posterior communicating arteries. According to my view, these correlate a corresponding commissure, and this, I think, is the formix or great inferior longitudinal commissure of the hemisphere. So that the posterior communicating arteries are to the formix of each hemisphere what the basilar artery is to the pons Varolii.

“Looking, then, at the anatomy, physiology, and pathology of the encephalon from this new point of view, we can broadly allocate function, blood-supply, and trophic change to three distinct regions, any one of which may be involved morbidly without the other manifesting change, yet connected with each other, and of which each symmetrical half may be involved without affecting the other half; these are—1. The corporeal region, including the medulla oblongata supplied by the cerebellar arteries; 2. The animal, supplied by the posterior cerebral; and, 3. The mental proper, or intellectual, supplied by the internal carotid arteries. The commissural union, or conjugation of this last-mentioned region, is indicated by the anterior commissure; and its correlative arterial development is either the anastomosing anterior communicating artery, or, as is sometimes found, integration of the two anterior communicating arteries, so as to form one trunk like the basilar. Thus the circle of Willis is constituted so as to represent in the arterial system the commissural connections of the encephalon.”

Prof. Laycock now enters into the question of cerebral development in connection with the vascular system; and gives illustrations of the principle that irregular or imperfect development of an artery on the one side indicates irregular or imperfect development of the parts which it should naturally supply; while, on the contrary, the size of the artery indicates the extent of development. He believes that, if inquiry were made into the pathological antecedents of persons whose bodies manifested anomalies in the development of the encephalic arteries, we should find that they had some unsymmetry of

cranium, and had exhibited a tendency, at least, during life, to encephalic neuroses.

To apply his views on trophic and vaso-motor anatomy of the brain clinically, "it is necessary to consider the anatomy of the nerves in relation to the blood-vessels. For example, the ophthalmic artery, a branch of the carotid, supplies, besides the eye, an important clinical region, viz., the sinuses, the lachrymal gland, the muscles of the eye, the eyelids and eyebrows, and the frontal muscles. Besides the obvious emotional relations of these parts, here are situate the seats of frontal headaches, coryzas, supra-orbital neuralgia, and leprosy, exophthalmos, œdema, and pigmentation of eyelids, due to trophic changes. Clinically, we conclude there must be a common centre, or centres, of motor, vaso-motor, and trophic action; anatomically, we derive no information as to this fact, because the integration of ganglia in the occipito-spinal region, with which the trophic, sensory, and motor nerves are connected, is too complete to be easily unravelled. It is possible, however, to obtain sufficient general knowledge by what may be termed circumstantial evidence. The face and cranium are made up of coalesced vertebræ. Let us suppose the trigeminus or fifth nerve represents three of these, then the ophthalmic branch will enter into the primary elements of one vertebra, and that the most anterior, and we can, therefore, classify the ophthalmic artery with it, and the ophthalmic ganglion with both. Turning to the anatomy of the fifth, we find that both the motor and sensory fibrils emerge close to the junction of the crus cerebelli with the pons; hence 'coarse' lesions at this point would affect both the peripheral and central terminations through the trunks of the nerve, but dynamic changes would be influential lower down, at the ganglionic centre in the cord. Now, the sensory branch of the fifth arises from the 'gray tubercle,' which is in intimate connection with the sensory centres of both the vagus and glosso-pharyngeal nerve. Here, then, is the spinal centre, and here are, probably, those trophic commissural connections which determine the morbid conditions I have mentioned.

"Clinical facts plainly show that this region is spinal. The eyebrows fall off in leprosy (an affection of spinal nerves), the eyelids are œdematous and pigmented diastaltically in connection with certain uterine and urinary disorders; the eyes stare not only in mania and in certain emotions, but also in a cardiac neurosis with vascular bronchocele, known as Graves's disease. Further experimental researches, by Claude Bernard, show that pinching the *motor* roots of the seventh and eighth cervical and first dorsal nerves excites a projection of the ball of the eye, together with dilatation of the pupil. Hence, the term 'oculo-spinal' Claude Bernard has given to the corresponding portion of the spinal cord. It follows, therefore, that there are two centres in the occipito-spinal region. I have marked off one for changes in relation to mental states, another for corporeal conditions. As the eyebrows seem never to become gray from emotion, they are spinal in their trophic relations.

"A similar general fact comes out when we trace the causal connections of epilepsy, hysteria, and of other convulsive diseases with or

without abolition of consciousness. Some of the phenomena are very distinctly manifested in viscera connected with the spinal cord, others with muscular structures of the face that subserve to the manifestation of the various states of consciousness, more especially of emotions, others with purely mental tissues. The connections of the third and seventh pairs of nerves with the occipito-spinal region are of this class. Laughter and weeping are emotional changes. When, however, they occur morbidly, with an imperfect abolition of consciousness, they are spinal, and differentiate hysteric from epileptic convulsions; and to these we add other spinal phenomena, such as globus, flatulence, limpid urine, and, probably, an orgasm of the uterus. Hydrophobia, whether we regard its sensorial or convulsive phenomena, holds an intermediate place between hysteria and epilepsy, yet with a spinal-tetanic character; in all these the region of the lower or animal instincts is more or less involved. The region of epilepsy has a wider range, because the vascular system of which it is the seat is of much wider extent. Downward the symptoms are chiefly convulsive, upward chiefly sensory, until we see in the so-called 'petit mal,' and in epileptic delirium, mania, and automatic impulse, phenomena exclusively cerebral. It is because the epileptic vascular area includes the cerebellum—the great trophic centre, and the sensory system of the head and cranium—that mania and dementia are more apt to follow upon epilepsy than on hysteria, and all those trophic changes in the skull which coincide in long-standing cases of epilepsy. In epilepsy, the hereditary transmission of defects in cerebral nutrition is more certain than in hysteria, and this, I think, because of the connection of the cerebellum with the genetic glands. In hysteria the symptoms are more obviously dynamical; it is only when the phenomena become epileptiform that the prognosis as to consecutive brain-change becomes more important. From this point of view the *ejaculatio seminis* during an epileptic paroxysm is not without meaning in investigating the causal relations of solitary vice and sensual indulgence to epilepsy and brain-disease. I may add here that the pathological observations made by Gall, Serres, and others, indicate that this region is in anatomical and physiological relation with the sexual organs, but perhaps more especially that of which the superior vermiform process or median lobe is the centre, and which has direct commissural connection with the brain. With a knowledge of these facts, we can understand not only why this region is the seat of vaso-motor neuroses, like puerperal and hysteric convulsions, catalepsy, and convulsive epilepsy, but why certain morbid sensorial conditions (*æsthesiæ*) are caused by sexual excesses, and why utero-ovarian changes, whether during pregnancy or otherwise, induce, by direct or diastaltic action on the basilar centres, peculiar modifications of the appetites and instincts. To this group belong those changes in cerebral function and structure leading to insanity which supervene in certain kinds of epilepsy, more especially that termed the 'petit mal,' which is, in fact, a *sensory* epilepsy."

Dr. Laycock then discusses in considerable detail the modes in which the anterior and posterior spinal arteries arise in development from (or, in ordinary phrase, are distributed to) the spinal cord; after which he proceeds to mention the following clinical fact:

"Both the vertebral and the spinal arteries have intimate anastomoses with the vessels of the spinal muscles; so intimate, indeed, that the latter must be considered as in the same vaso-motor areas of activity: so that there is a sort of analogy between the relations of these spinal muscles to the cord, and those of the cranium to the brain; and so, also, as to certain sensory nerves. Bearing these and other facts in mind, we will illustrate their practical application:

1. In congestions and inflammations of the cord and its membranes, the vaso-motor system of the cervical muscles is included, as is shown by the retraction of the head in cerebro-spinal meningitis, or 'purple' fever, and in cerebral meningitis of children. A study of the connection of the spinal arteries, through the 'reënforcing branches,' with those of the spinal muscles enables us to understand this pathognomonic sign, and also why ice-cold applications to the spine are so directly indicated in these cases; but it also warns us not to adopt the too mechanical theory of the cerebro-spinal circulation of the descriptive anatomist.
2. We can have clearer views of the headaches and backaches (rachialgia) so common in various diseases. The coronal headache, often associated with nervous heat and baldness of the crown, is probably a neurosis due to changes in the sensory centres situate in the occipito-spinal region, upon which the other symptoms of 'nervousness' also depend. The occipital headache has a like origin, but lower down—more, in short, in the cerebellar region.
3. Pain in the lumbar region is a very distressing symptom in various fevers—more especially in small-pox, yellow fever, and remittents and intermittents—in cases of nervous debility from sexual excesses, and in diseases of the kidneys, uterus, ovaria, and testes. Where is the seat of this lumbar pain? It is often muscular, but often, I think, in that spinal region where the posterior spinal arteries terminate, or, more correctly, whence they arise, and which I name the genito-spinal. It corresponds in the cord to a point opposite the second lumbar vertebra, and has direct diastaltic connections with the occipito-spinal region, and especially with the areas supplied by the anterior cerebellar and posterior cerebral arteries. The nerve-centres comprised in these areas are the essential cerebral mechanism in all vertebrates.
4. It is from these intimate connections that lumbar pain is so constantly associated with frontal headache, especially in fevers and in spermatorrhœal debility, the line of communication being the formix.

✓ Since all this region is the primary region of the senses and of the animal instincts and appetites, on like grounds we can understand how it is that affections of the genito-spinal region—as diseases of the kidneys, spermatorrhœa, and other like disorders—not only affect the nutrition and functions of the cerebellum and other centres in the occipito-spinal region, but also of the nerves of sense—more especially of the retina—by vaso-motor diastaltic action on the cerebral ganglia. In like manner we can understand how there is a close connection between morbid changes in the retina, as revealed by the ophthalmoscope, and structural diseases of the brain and spinal cord, and how lesions of the sensory portion of the genito-spinal system, such as those which constitute the anatomy of loco-motor ataxy, may extend

upward according to the 'Wallerian' law of degeneration, and bring on mental diseases dependent on vascular degeneration, like that termed mania, with general paralysis.

"It is essential, however, to the clear understanding of the connection of these clinical vaso-motor areas, to take into consideration the trophic and vaso-motor areas of the mental regions proper of the encephalon, more especially with regard to the effects of excessive mental labor or brain-work. I have indicated various points of this division in my psychological text-book, 'Mind and Brain,' second edition, vol. ii., p. 475. I would only here observe that the same principles which I have applied to the vertebral vaso-motor system are available to the cranial proper, as represented by that of the internal carotid system. The anterior cerebral arteries are united by the anterior communicating artery representing the anterior commissure. Now, this commissure is sometimes represented by integration of the two anterior cerebral arteries. Follow, however, their branches, and you will find that they subserve to the functions of two commissures of the hemispheres—the transverse or corpus callosum, which combines the two, and the inferior longitudinal, which combines the brain-activities of each. Hence vaso-motor disorders of this anterior cerebral system are likely to induce that disordered unity of consciousness which is the predominant character of delirium and insanity. On the other hand, this region may be unaffected while the posterior cerebral region is disordered, in which case the instincts and appetites may be insane, and the intelligence untouched. In this mental area, also, the law of arterial development coincides with that of cerebral and mental development, for the radicles of the external carotid system extend back to the posterior regions of the convolutions, in accordance with the law of cerebral development, which is backward as well as forward. In short, all the higher convolutions are later in development, and occupy the lateral anterior and posterior regions of the cranium.

"It is within this mental area, that the phenomena of true aphasia are manifested, not, however, merely as restricted by pathologists to structural lesions visible to the eye, but when manifested as mutism in certain cases of melancholia, in dementia, cretinism, and idiocy."

II.

PHYSIOLOGY AND PATHOLOGY OF THE BRAIN AND NERVOUS SYSTEM.

1.—*Rules for localizing Chronic Lesions of the Nervous Centres.*
Prof. BENEDIKT. (Wiener Med. Presse, July 2, 1871.)

HE gave prominence to the law which may be called Bell's (A): *The sum of diseased fibres collectively is observed, and the morbus loci is where these fibres anatomically lie side by side.*

With the help of this rule it is especially possible to diagnose seemingly peripheral neuroses from the real. It is further possible, with the

help of physiological and pathological anatomy and physiological experiments, to formulate a collection of special rules for localizing the lesion :

1. *The appearance of synchronous and symmetrical paraplegia points to disease of the anterior half of the spinal cord or its envelopes.*

Only very exceptionally does a spinal paraplegia affecting the legs or arms arise from two hemiplegias.

Paraplegia of the legs generally points to disease at the level of the lumbar enlargement; paraplegia of the arms, an affection of the cervical enlargement.

Paraplegia from disease of the vertebral column is characterized in its course by the primary preponderance of the symptoms of diseased vertebræ at the seat of the lesion, and is shown by the greater implication of the posterior roots and their long-continued irritation in *paraplegie douloureuse*.

2. *Cerebral paraplegia clearly arises from two clearly-defined hemiplegias.*

Exceptions due to disease of the spinal cord are exceedingly rare.

3. *Characteristic tabetic symptoms show disease of the posterior half of the spinal cord.*

4. *Progressive muscular atrophy shows disease of the gray substance of the cord in the neighborhood of the central canal, or at any rate diffused disease of the anterior roots, and the accession of atrophy of the extremities to the number of spinal symptoms has the same significance.*

5. *Hemiplegia with opposite hemianæsthesia points to disease of one-half of the cord.*

The hyperæsthesia on the same side with the paralysis arises probably from paralysis of the vaso-motor nerves on the affected side.

6. *Bilateral tabetic neuralgia of the legs or arms in central neuroses shows disease of the posterior roots and their central prolongations.*

7. *Progressive paralysis of cerebral nerves points to a more or less diffuse disease of the region of the medulla oblongata containing their nuclei as far as the crura cerebri, or diffuse disease of the peripheral prolongations of these nuclei.*

8. *Paraplegia of the tongue (alalia) and its inception-stage, as well as difficulty of deglutition, signifies a disease at the level of the hypoglossal and glosso-pharyngeal nuclei.*

9. *Hemiplegia, with opposite facial or oculo-motorius paralysis, shows disease of the fibres of the pyramid at the level of the affected nuclei, especially of the points of exit of the affected nerves.*

10. *Hemiplegia, with hemianæsthesia of the same side, points to disease of the fibres of the pyramid between that level in the medulla oblongata at which the decussation of the sensitive fibres is accomplished and the entrance (inclusive) of the outer bundle from the foot of the crura cerebri into the medullary substance of the hemispheres behind the lenticular nucleus.*

Exclusive hemianæsthesia, or where that predominates over hemiplegia, points by preference to the latter spot.

11. *Hemiplegia, with incomplete facial paralysis (the upper branch remaining free), shows disease of the central motor ganglia.*

The electrical examination, especially the discovery of crossed reflex action, is of signification for the localization of the paralysis within the crura cerebri (Gehirnstammes) and the central ganglia.

12. *Hemiplegia, with convulsions, points to a lesion of the cerebral hemispheres central from the central ganglia.*

The more the convulsions become prominent, the nearer is the locality to the convolutions.

Complication with aphasia (the ability to understand speech remaining) shows the locality of the lesion to be in the anterior lobe in the neighborhood of the island; complication with bilateral neuroretinitis shows that it is above the optic thalamus.

Many times the convulsions do not appear in disease of the hemispheres with hemiplegia, because, on one hand, with the occurrence of the lesion, e. g., acute softening, hydrocephalus occurs and renders the irritation of the central ganglia impossible on account of pressure, or, again, the pathological change (e. g., new growth) does not give rise to symptoms until it presses mechanically on the central ganglia.

13. *The most essential symptom, in uncomplicated disease of the meninges (Gehirnwände), is convulsions, and paralysis never occurs without previous convulsions.*

Here the author entered upon the signification of single symptoms for localizing the lesion, and stated that psychical disturbance, under all circumstances, pointed to primary or secondary disease of the convolutions of the brain.

Static vertigo (Statisches Schwindel, lateral progression) shows an affection of the cerebellum, although the entrance of the cerebellar fibres into the crura cerebri may be diseased.

Contractions of central origin may be of spinal or cerebral nature; the former are usually bilateral, the latter unilateral; the former are, as a rule, limited to the extensors, the latter to the flexors. Spinal contractions never occur without evidence of abnormal reflex irritability, and are both excited and increased by sensorial influences; cerebral contractions are likewise the product of sensorial irritation, since they generally cease during sleep, and are increased by every sensorial impression. But cold and heat have also influence over the contractions of cerebral origin. Hence it may be said, contractions are probably not independent motor symptoms, but are caused by sensible and sensorial reflex irritation.

Trembling, caused by the rhythmical contraction of groups of antagonistic muscles, may be either of spinal or of cerebral origin. It is not identical with paralysis agitans, the latter being a morbid unit.

14. *Trembling, as a symptom, cannot be referred to any special location of the lesion.*

The author spoke against the attempt to localize paralysis agitans in the central motor ganglia, because this affection is undoubtedly dependent anatomically upon sclerosis, and it is not logical to suppose that the beginning of the process will be delayed on the right until it has advanced so far on the left as to affect both the upper and lower extremities on the right, especially as the pathology of the chronic lesions of this part is known, and shaking is only seldom noticed.

Further, from the above considerations, and from the fact that in

tabes and contractions of the facial from peripheral cause, and in convulsive tic, the influence of the will is marked, results the rule.

15. *Influence of sensorial irritation upon a phenomenon due to motor irritation is no proof of location of lesion within the brain.*

Considering that the morbid phenomena in locomotor ataxy are notoriously caused by disease of the sensitive part of the cord, and that choreic spasms depend on sensorial, and probably also on increased spinal irritability; further, that convulsions symptomatic of brain-disease are observed only in a condition of irritability of the hemispheres; it follows—

16. *Phenomena of motor irritation from central cause are excited especially by the irritation or at least the coöperation of the sensitive and the sensorial fibres.*

But even when all the chasms in the localization of all symptoms and of the groups of symptoms caused by foci of disease are filled up, there still remain a large number of cases in which an attempt at exact localization must fail. This is owing to the fact that many forms of disease (e. g., sclerosis, hæmorrhage, many new formations, etc.) have a tendency to become diffused. There is only the question whether there is reason to suspect a diffused process, and how it can be localized. The first question can be easily answered. There is reason to suspect a diffused process when the symptoms due to known and different localities are combined and occur together. It is, then, evident that the concentration-law of Bell (A) does not answer, and that another law, the *diffusion-law of localization* (B), must be employed.

B. *If a combination of symptoms and groups of symptoms with known and different localization of lesion is present, each must be referred by itself to its known locality.*

This rule is so simple, it would seem needless to mention it; but the history of diffused sclerosis, of dementia paralytica, of chorea minor, etc., shows that even now it is but little regarded.

The rest of the article is occupied with the application of this rule to diffused sclerosis, bulbar paralysis, and progressive atrophy, the ascending and the descending paralysis of the insane, chorea minor, and hysteria.

2.—*Bromide of Potassium in the Treatment of Epilepsy.* I. LEGRAND DU SAULLE. (La nuova Liguria Medica, No. 3, 1871. Allgemeine Med. Central Zeitung, No. 27, 1871.)

1. At its commencement epilepsy frequently is revealed by peculiar symptoms in the general health (change of temper, vertigo, faintness, spasm, incontinence of urine), the true pathological cause of which is not recognized.

2. These initial symptoms always appear in an identical manner and form, the so-called *petit mal* or the exact representative of the prodrome of the *grand mal*, or complete attack.

3. If the convulsive form is fully developed, the paroxysms occur without cause. In cases where cure follows, the attacks disappear first; but, in cases not fully developed, the paroxysmal symptoms are influenced last by medication.

4. Not only is the idiopathic epilepsy more frequently susceptible of healing than is supposed, but in the other species it is possible to diminish the frequency of the attacks, so that their remissions are almost equal to a cure.

5. Of all means of cure, bromide of potassium (free of iodine) has proved the most valuable. Even when it does not notably diminish the number of attacks, it yet removes the nervous condition, the irritability of the patients.

6. In adults a noticeable effect is seen first by the use of four to six grammes a day, which, in individual cases, may be increased to ten grammes.

7. The physiological effect of the agent does not at all influence the general health. It is necessary to caution the patient only in regard to the passing anaphrodisia which may appear.

8. Every physician may be certain of a favorable result by regarding the following precautions: Use a perfectly pure preparation; careful regulation of the effect after each week's treatment; continuance of the treatment for a year, and repetition of it during the second year, every third month.

II. RIEDEL. (*Sitzungs-Bericht der Hufeland'schen Gesellschaft von 1870. Allgemeine Med. Central Zeitung, No. 37, 1871.*)

The author reviews the pathology of the disease, and the means formerly used to diminish the irritability of the medulla oblongata. The attention of physicians in Germany was directed especially by Höring (1838), and A. von Graefe (1841), to the influence which bromine and bromide of potassium have over the secretions and over resorption. Then, in France and England, was noticed the diminution of sexual desire, and sensibility in the œsophagus, after its use. Then appeared notices of cure of epilepsy by bromide of potassium by Stocking, Crichton, Browne, Williams, Vigouroux, Debout, and others. In Germany, experiments in regard to its healing power were made by Griesinger and Sander. Meanwhile many, especially Eulenburg and Guttmann (1867), were experimenting in regard to its physiological action.

All experiments agreed in the following points: 1. Bromide of potassium diminishes the reflex power of the nervous centres, reduces the sensibility as well as the muscular irritability. 2. It causes contraction of the calibre of the small vessels. According to this, bromide of potassium was considered as a rational remedy for epilepsy.

In 1866, the author had employed bromide of potassium in epilepsy, but as he gave only three to five grains many times a day, he obtained no effect. After Griesinger's advice he used large doses, up to a drachm a day, and had better result. By mistake, a patient had taken during one week two drachms a day. The attacks of epilepsy, which had previously appeared every night, were absent; but a peculiar accident occurred: there was a sudden loss of muscular power, especially in the legs. These symptoms disappeared when the dose was reduced to a drachm a day.

Since 1866 the author has treated thirty-three cases of epilepsy with bromide of potassium: five of these have recovered (as such only those are counted who have remained without an attack for at least

one year), ten have been improved, ten have given up the treatment too soon, four have obtained no benefit, and with four it is too soon to anticipate the result.

III. LUTZ. (Berlin. klin. Wochenschrift, No. 18, 1871.)

In ten cases of epilepsy, which he treated with bromide of potassium, he obtained the following results: Three cases had remained six months without an attack. In one case (a strong young farmer, twenty years old, who had had epilepsy nine years, and toward the last of the time before the treatment had had four to six attacks daily), the attack returned about every four weeks, but with less severity. In another case (of six years' duration), every six weeks. Five remained under treatment, but with good prospect of improvement. At first he used one to three grammes a day, without benefit; then he increased the dose from ten to twenty grammes a day, and improvement soon appeared. Except a few papillæ and some abdominal pain which did not return when the drug was taken after breakfast, he found no unpleasant symptoms following its use. In one case, where the intelligence had become very weak, it was nearly restored.

He found the combined use of bromide of ammonium very beneficial, a new proof that bromine is the efficient ingredient.

3.—*A Peculiar Form of Infantile Paralysis from Scattered Spots of Cerebral Softening.* TH. SIMON. (Virchow's Archives, 52, i, 1871, p. 103.)

The author briefly alludes to the difference of opinion between Virchow and Jastrowitz, the latter referring the presence of granular corpuscles (Körnchenzellen) in certain parts of the brain to physiological conditions, the former to pathological. The author thinks that in the cases described by Virchow he is correct, for there were large collections, sufficient to be seen with the unaided eye. He records three cases in which the symptoms are similar. The patients were two brothers and their sister. Two older children were healthy. In the first case the boy (Alfred) had frequent cramps soon after birth, and learned to walk at a late period, and spoke imperfectly. He was never able to walk well, but toward two years of age his gait became less steady, and he had frequent attacks of cramp; some months later he lost all power of walking. He had attacks of stupefaction, lasting a day or so. The cramps soon ceased. At four years of age he appeared strong and well built, but this was owing to the development of adipose tissue. Special senses were not interfered with. Speech was imperfect, deglutition good, intelligence was poor. The legs were bent and extended while he was in bed, but he could not stand or walk. The legs resemble those of a rachitic child. The arms were similarly affected; all motions could be performed, but so weakly and unsteadily that the child could not feed himself. During six months there were two periods during which he became worse, and he was removed from observation. The second case (Mathilde S.), three years old, resembled the first, except there were no cramps. This case proved fatal. The spinal dura mater was perfectly normal, the veins on the posterior surface unusually full. The pia mater was pale and thin, but in the

region of the third dorsal vertebra, on the posterior surface, was a spot, half a centimetre long, of thin, firm, white membrane. The cord seemed to be healthy. The fontanelles and frontal suture were closed completely, the other sutures were indented, the dura mater was normal, the sinuses empty. When the brain was removed, the left cerebral hemisphere was much flattened, and sank together. It felt soft, and as if fluctuating. On trying to remove the pia mater, portions of the cerebral substance remained adherent to it, and in many places a reddish soft mass ran out. On section, there was seen an unusually large nucleus of softening, which had almost entirely destroyed the medullary portion of the left cerebral hemisphere, and especially in the frontal lobe approached near the surface, and implicated also the gray substance. Next to the frontal lobe, the temporal lobe and the neighborhood of the inferior cornu were most affected. The isle of Reil could not be found. The vertex and gyrus formicatus were most preserved, yet in the parietal portion were many small and large nuclei of softening. The part of the cerebral substance not softened was firm.

In the right cerebral hemisphere were a very large number of nuclei of softening, but they had not united into so large a one as on the left. In the right frontal lobe were four; in the other lobes still more softened spots, which even implicated the cortical substance. At these points the pia mater could not be removed, but elsewhere could be easily. Otherwise the white substance was firm. The lateral ventricles were filled with reddish, turbid serum, as many nuclei in the inferior cornu had broken through the ependyma. The great ganglia were free, so also the cerebellum, pons, and medulla. The vessels at the base were not obstructed, their walls thin. No microscopic examination could be allowed.

The third case (Robert), one year and nine months old, was only seen in its commencement.

The fourth case (George H.), two and three-fourths months old, was seen only toward the close of life. On post mortem was found nothing abnormal in thorax or abdomen. In the brain the medullary substance of both cerebral hemispheres was scattered, with numerous and large, reddish, softened spots. The microscope showed, in addition to red blood-cells and fine granular detritus, numerous granular corpuscles, free in the softened mass, and forming thick layers about the vessels. Spinal cord seemed normal.

The author believes that in these children numerous spots of encephalo-malacia were present at birth, that these caused few symptoms at first, but from the second year the extension of the disease increased, and resulted in the symptoms found at death. He is not prepared to decide whether syphilis was the cause of the disease.

The cases are so dissimilar to other known forms of infantile paralysis, and so agree with each other, that, even without careful microscopic examination, he does not hesitate to report them as a peculiar form of paralysis, characterized by the manner of its commencement—quite gradually developed in the second year; by its union with disturbance of the intelligence, especially of speech; by the nature of the motor derangement—paresis in all the limbs with retained electro-

muscular contractility; by the serious disturbance of function and the gait, resembling tabes; and, finally, by the absence of all disturbance of sensibility.

4.—*Contribution to the Knowledge of Atrophia Musculorum Lipomatosa. (Muscular Sclerosis.)* OTTO BARTH. [Archiv. d. Heilkde., 2 Hft., 1871. All. Med. Chir. Zeitung, July 5, 1871.]

In one case which came under Dr. Barth's observation a careful examination was made after death. The muscles were almost throughout remarkably pale, streaked and peculiarly oily in appearance, so that at first sight they resembled the subcutaneous fat rather than muscle. The vertebral canal was thickly lined with common adipose tissue, so that the dura mater spinalis was pressed inward considerably; likewise the intervertebral foramina were completely filled with adipose tissue, the ganglia surrounded by the same. The inner surface of the dura mater was smooth, but exhibited a large number of white patches of the size of a pin's-head scattered regularly over its surface. The pia mater and arachnoid were normal. The spinal cord itself was of normal thickness. Transverse sections made at different heights showed a variation in the white substance; it contained in part very sharply-defined, wedge-shaped, or rounded gelatinous-appearing spots, which did not, however, occupy the entire column, but seemed to be irregularly distributed. In many sections the circumference of these spots seemed rich in blood, in others the spots themselves were so. In the brain was nothing special beyond a moderate anæmia; the sinus of the dura mater toward the back was filled with dark coagula.

The right gastrocnemius, which seemed to be most changed, was examined microscopically. Small portions were cut out and picked to pieces. It contained single fibres which were normal in size, striation, and color; but with these, and in greater abundance, swollen fibres in which the striation was not clear, and in which a marked fatty degeneration was visible, finally fibres which retained their striation, but were diminished in size. In a larger mass were found grouped capillaries and numerous firm connective-tissue fibres with clear nucleus; only here and there fat-cells, which adhered to the connective-tissue fibres. The transverse and longitudinal section of the muscle, hardened in chromic acid, appeared quite different. The muscular fibres were in decidedly less number than the bundles of connective tissue, but especially in comparison with the isles of fat scattered between, which had insinuated themselves partly between the separate bundles of muscle and partly between the muscular fibres. The appearance of the cross-section varied from Griesinger's representation only in that less thick connective-tissue net-work was found between the isles of fat, that the muscular fibres were surrounded generally by a loose connective tissue rich in nuclei. Corresponding to this appeared the longitudinal section: many fields of view showed only adipose tissue, with here and there large arteries with thick walls. The latter gave off massive-grouped capillaries, which ran toward the portions containing muscular fibres. With stronger powers many fibres were shown to be capillaries running parallel with the muscular fibres. The larger number

of connective-tissue nuclei were found in the vicinity of the small vessels.

In the spinal cord, after treating with bichromate of potassa and chromic acid, the remarkable dark color of single spots of the lateral columns was very evident; this was well marked toward the posterior part on the right side, where only a few divided nerve-fibres could be recognized. In spots of the same was found here a finely-granular substance crossed by large vessels filled with blood, and rich in corpora amylacea. It was further noticeable that this degenerated part was sharply defined externally, and covered with a zone of healthy nerve-fibres which was about one mm. thick. The latter was again covered with a layer of three times that thickness, in which lay corpora amylacea in masses. These were also found in considerable numbers between the fibres of the anterior roots. The anterior part of the lateral column and the outer half of the anterior column were in better condition, but the portion bordering the anterior fissure was similarly affected as the degenerated lateral column. In the gray substance the very small number of ganglion-cells in the anterior cornua was most noticeable, also the strong dilatation of all the vessels. The central canal was obliterated. The posterior column in the cervical enlargement was unusually broad, elsewhere normal. In the dorsal region and the lumbar enlargement the anterior columns were also affected, and in the latter the degeneration of the lateral columns extended to the periphery.

The author refers the enormous increase of adipose tissue to a deep-seated disturbance of nutrition, and considers the lesion of the cord primary, supporting his theory on the lesion in the anterior column where is the origin of the vaso-motor nerves.

5.—*Disease of the Central Nervous System from various Wounds.*
O. BERGER. (Wiener Med. Presse, June 25, 1871.)

Dr. Berger found, in many cases of simple gunshot wound of muscles, disturbance of sensibility, chiefly on the same side with the wound, which implicated not merely the skin, but also the neighboring mucous membrane, and consisted of diminution of all the varieties of sensibility. There were also, in many cases, loss of taste and of smell, great nervous deafness on the corresponding side. Among a certain number of patients, the diminution of sensibility was only in the wounded extremity and in the region of the principal nerves of the neighboring plexus, and only in a few was it confined to the wounded limb or the neighborhood of the cicatrix. Also, the electro-muscular sensibility and the peculiar sense of strength (*Kraftsinn*) were generally diminished. The reflex irritability was also diminished proportionally with the anæsthesia. One patient, with a bayonet-wound through both thighs and the testicle, the right femur being injured, soon after receiving the wound had a feeling of numbness in the right half of the body, especially strong in his face. The anæsthesia extended to the bones and joints, so that the perception of passive motion, as well as the idea of the position of the limbs, was entirely lost. Notwithstanding this complete anæsthesia of the right

side, the right arm and leg showed no sign of disturbance of coördination.

In nearly all the cases, although months had passed since the reception of the wounds, without loss of separate motions there was a loss of power in the muscle of the injured limb as a whole, chiefly dependent upon long-continued disuse; there was also diminution of the farado- and galvano-contractility, and of the irritability of the nerve-trunks. In some cases there was also, on the uninjured limb of the wounded side, diminution of the galvanic irritability of the nerves, and also of the farado- and galvano-contractility of the muscles, without loss of motor power. In two cases was a complete motor paralysis of a distant limb not at all connected with the wounded one—in one, a bayonet-wound of the right shoulder, two inches long, was followed by paralysis of the left leg; and in the other, a flesh-wound of the neck, by paralysis of the left arm. In a number of injuries to the nerves, the extensive disturbance of sensibility did not appear in a remarkable degree.

6.—*Nerves of the Buccal Mucous Membrane.* E. ELIN [aus Sibirien]. (Centralblatt f. d. med. Wissenschaften, No. 15, 1871.)

The author has examined principally the mucous membrane of the palate of rabbits, and has reached the following conclusions:

1. Small nerve-branches, formed of only a few medullary fibres, pass from the submucous tissue into the mucous membrane, running parallel on to the other in an oblique or nearly perpendicular direction. Each branch then divides into many, so that in the superficial layer of the mucous membrane the medullary nerve-fibres are found separate.

2. The medullary fibres, in preparations colored with gold, show regular dilatations, which give them a varicose appearance. The above-mentioned fibres, running separately or two together, are enclosed in a relatively very thick sheath of schwann, which contains nuclei, and is but feebly colored by gold.

3. In the most superficial layer of the mucous membrane the separate medullary fibres divide into many fine nerves without medullary substance, which change their direction to become parallel with the surface, and are united into a subepithelial net-work containing only few nuclei.

4. Out of this net-work pass fine nerve-fibres without medullary substance, partly with blood-vessels into the papillæ, from the summit of which they enter the epithelium, in part they enter the epithelium directly from the mucous membrane between the papillæ.

5. The fine nerve-fibres which pass into the epithelium are almost exceptionally distinguished by small, granular dilatations, which occur at regular intervals in their course. They enter the epithelium almost perpendicular to the surface, run a more or less winding course, split up or give off fine side-branches, which again divide and form a net-work enclosing the epithelial cells. In the middle layer of the epithelium are irregularly-shaped, generally oblong bodies, which are intensely colored by chloride of gold, and generally have their long axis perpendicular to the surface.

6. Single nerve-fibres penetrate even to the outermost layer of flattened epithelial cells, where on cross-section they seem to end with a small swelling; these also give off fine lateral fibres, which are also distinguished by interposed granules. They surround the outer edge of an epithelial cell running parallel to the surface, and then bend down toward the mucous membrane.

Concerning the nervous character of the above-described fibres which run in the epithelium, there cannot be the least doubt, since they can be followed directly from well-known nerve-branches, besides having the quite characteristic granular dilatations.

7.—*The Physiological Action of Conium.* By VERIGO. (All. Med. Cent. Zeitung, July 8, 1871.)

The author sums up the results of his experiments in regard to this agent in the following conclusions:

1. Conium acts especially and most powerfully on the spinal cord, while it chiefly affects the nerves of motion.

2. This action is shown in frogs by symptoms of paralysis without any signs of cramp, independently of the size of the dose; in mammalia, however, after large (fatal) doses there is almost constantly severe cramp, but after small doses, which are not fatal, there appears only the paralysis in the extremities.

3. The paralysis advanced from the cord toward the periphery of the sensory nerves (?), which is affected later.

4. The brain is to all appearances little affected by conium.

5. The sensory nerves are not at all affected by it.

6. In small doses conium diminishes the respiration; in large doses it may entirely abolish it, which does not depend upon the affection of the peripheral nerves, as Kölliker thinks, but upon paralysis of the cord.

7. Among mammalia the appearance of cramps is an almost sure sign that death is imminent; they are a symptom of poisoning, and do not depend upon the cessation of respiration.

8. The blood seemingly undergoes no change, at least the corpuscles do not lose their ability to absorb oxygen.

9. Conium does not affect the heart and pulse.

10. It diminishes the temperature of the body, and the more considerably as the paralysis advances. Its influence over the pupil is not constant.

11. Conium has a more powerful and more rapid action when injected into a vein, weaker when taken by mouth or under the skin. In both the latter methods its action is equal.

12. It has no influence on the quantity or composition of the urine.

13. Applied externally, it produces only a slight itching.

14. After poisoning with conium, no constant characteristic appearances are found.

8.—*The Reflex Innervation of the Blood-vessels.* DR. FRANZ RIEGEL. (Med. Jahrbücher, von der König. Kaiserliche Gesellschaft der Aerzte, Wien, No. 1, 1871.)

The author endeavored to measure the changes in the calibre of the vessels, and also the rapidity with which the blood flowed. For the second purpose he employed as a measure a stream of fluid holding opaque bodies in suspension, which he caused to pass through a glass tube inserted in the eye-piece of his microscope; being able, by regulating the height of the reservoir, to obtain a regular current of any desired rapidity. The observations were made on *rana temporaria* and *esculenta*, during May and June, the frogs being poisoned first with curara. By the use of two microscopes he was able to examine both legs, one immediately after the other, and compare their vessels with each other.

He could not find, in most cases, that the division of the sciatic nerve produced any change in the circulation: in a few cases there were a dilatation of the arteries and retardation of the current. On irritating the peripheral end of the divided nerve with a strong galvanic current, he obtained retardation of the current, and soon complete cessation, but this seemed to be due to induced effect, as the same result was obtained when the current passed through connective tissue alone. A very weak current passed through the nerve had no effect on the circulation. Mechanical irritation of the peripheral end produced retardation, which he thought due to interference with the deeper-lying vessels; when this was avoided, he obtained no effect from mechanical irritation.

When he applied his electrical irritation to the central end of the divided nerve, a moderate strength of current caused a slight increase in the rapidity of the blood after two minutes, which at the end of ten minutes could be recognized without mechanical aid. He has found this to be true repeatedly in the same animal. At the same time there was contraction of the arteries.

The maximum effect, with weak current, was reached in about an hour, and then continued for a while. After cessation of the irritation, the effect continued, disappearing gradually.

Though the action of the heart was diminished by the application of ice, the effect of the electric irritation of the nerve was the same. He did not notice any effect on the heart's action.

Irritation of the skin with croton-oil caused first increased, then diminished rapidity of the blood, and finally stasis. When one sciatic nerve was cut, the increase of rapidity seemed less on the injured side, and the stasis occurred later on that side.

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ART. I.—*The Hamlet of Edwin Booth: a Psychological Study.* By A. O. KELLOGG, M. D., Hudson River State Hospital.

WHENEVER extraordinary claims to excellence in the delineation of Hamlet, undoubtedly the highest of dramatic creations, are advanced, it becomes not only the dramatic critic, but the student of psychological science, to examine the grounds and analyze carefully the qualities on which such claims rest.

The Hamlet of Shakespeare involves a most profound psychological problem, and one not yet solved to the satisfaction of many thinking minds; therefore, all studies of this character must be, to a certain extent, psychological. The line of demarcation between health and disease is here so obscure and delicately drawn, that the character, viewed from

a certain stand-point, seems on one side of the boundary, and again, viewed from another, as decidedly on the other, and hence the disputes as to the real or feigned insanity.

To a question once put to the elder Booth as to whether he considered Hamlet sane or insane, he is said to have made this remarkable reply, evincing that thorough grasp and appreciation of character incident to genius: "Something of both, but always *very uncertain*," said the great actor. This answer was undoubtedly drawn from the depths of his own spiritual experience, and seems to embrace the whole subject-matter in dispute. The commentator and the character both belonged to the same order of beings, and hence the fitness and truthfulness of the comment. Both were denizens of what we have before designated as that curious border-land that divides the realms of sanity and insanity, and both seemed sometimes on one side of the line and again on the other, as they were impelled by a strange and rare organization, over which the power of the will, at times, appeared to have little or no control. Both were "mad north-northwest," but, when the wind was "southerly," each "knew a hawk from a handsaw." When adversity, trials, temptations, and perplexities came upon them, like a piercing north wind, they were smitten and fell; but, when the "sweet south" breathed upon them as "upon a bank of violets," they revived again, and came forth in all their native and resplendent beauty and loveliness.

To have met either when the intellectual weather-vane pointed in a certain direction, no psychological lore would have been necessary to determine the question of their complete mental integrity; but, when blown about by the storms and tempests of life, without compass or ballast, no expert was needed to predict, sooner or later, intellectual shipwreck.

Hamlet, as we have shown in a former paper on this character,¹ was a melancholic, and melancholy is now regarded not merely as the "nurse of frenzy," into which it very frequently passes, but a distinct form of mental derangement. "Since learning this," said one great delineator of Hamlet once to the writer, "I never ask myself, in playing the

¹ See "Shakespeare's Delineations of Insanity," etc. Hurd & Houghton, 1866.

character, 'Am I sane or insane?' as I constantly did before." Under the excitement of the interview with Ophelia in her chamber, and also with Laertes at her grave, he is quite beside himself, and his language, appearance, and loss of self-control on both occasions, give unmistakable evidence of mental derangement. On the contrary, during the interview with his mother, and upon other occasions, though he does not lose self-control, he seems ready at any moment to pass the boundary-line, with the same results seen both in the chamber and at the grave of Ophelia. His condition is always, in the language of the elder Booth, already quoted, "very uncertain." He has no self-reliance, neither can he be relied upon. He makes high resolves, but he executes only by impulse. Yet he is honest, and means to carry out his purposes, and keep his promises, but he has not always the power to do so, and the condition which prevents him is one not merely of inherent weakness of character in certain directions, as set forth by Goethe in the subjoined extract from his "Wilhelm Meister," but of engrafted melancholia :

"Imagine to yourself a prince whose father dies unexpectedly. The desire of honor and love of power are not the passions which animate him; it is sufficient for him that he was the son of a king; but now he is under the necessity of observing carefully from a distance the difference between the king and the subject. The right to the crown was not hereditary, yet a longer life of his father might have made the claim of his only son stronger, and the hope of the crown more secure. Now, on the contrary, he must attain it through his uncle, and, notwithstanding the apparent promise, perhaps he is forever shut out from it. He now feels himself poor in graces and goods, a stranger in that which, from his youth up, he was accustomed to regard as his own by right. Here his spirit receives the first heavy stroke. He feels that he is no more than any nobleman, indeed, not as much. He regards himself as a servant of all. He is not courteous, not condescending, but, rather, bowed down and abject. He now looks upon his former circumstances as upon a vanished dream. In vain does his uncle encourage him, and seek to show him his situation from another point of view; the perception of his nothingness never leaves him.

"The second stroke he receives wounds him yet more, bows him yet deeper. It is the marriage of his mother. To him, a true and tender son, there remains, after his father's death, a mother, and he hopes, in company with his noble mother left behind, to do honor to the heroic form of the great one departed. But he also loses his mother, and in a manner far worse than though death had torn her from him. That perfect ideal which a well-bred child so readily forms of a parent, vanishes; from the dead there is no help, and from the living no support. She is also a woman, and from the common frailties incident to her sex she is not exempt. Now, for the first time, he feels himself truly bowed down, and no fortune in the world can again restore to him that which he has lost. Not melancholy, not naturally reflective, melancholy and reflection become heavy burdens to him.

"Imagine, vividly, to yourself this young man, this princely son, fancy his circumstances, and then observe him when he perceives the appearance of his father's form. Stand by him on that terrible night when the venerable spirit himself walks before him. Huge terror and amazement seize upon him. He speaks to the wonderful figure, sees it beckoning, follows and hears. The terrible complaint resounds in his ears, calling for vengeance, and the pressing and oft-repeated entreaty, 'Remember me!' And, when the spirit has vanished, what do we see standing before us? A young hero that pants for vengeance? A born prince that deems himself fortunate in wreaking vengeance on the usurper of his crown? No, astonishment and sadness fall upon the lone one. He becomes bitter against the smiling villain, swears not to forget the departed, and concludes with the significant expression: 'The times are out of joint; woe unto me that I was born to set them right!' In these words lies the key to the whole conduct of Hamlet, and to me it is clear that Shakespeare would have pictured a great deed imposed as a duty upon a spirit that was not equal to that deed. This idea seems worked out in the entire plot. Here is an oak planted in a delicate vessel that should only have contained flowers; the roots strike out, and the vessel is destroyed.

"A beautiful, high, pure moral being, without the mental strength that makes the hero, travels under a burden which

crushes him to the earth, one which he can neither bear nor cast entirely from him. Every duty is sacred to him, but this is too heavy. The impossible was demanded of him; not that which was in itself impossible, but that which was impossible to him. How he writhes and turns, filled with anguish, strides backward and forward, ever being reminded, ever reminding himself, and at last losing sight of his purpose, without ever having been made happy."

Shakespeare, whatever may have been his intention, recognized what has apparently escaped even the penetration of the great German poet and philosopher, viz., that there are cases of melancholia, of a delicate shade, in which the intellect proper, so far from being overcome, may, perhaps, in certain directions be rendered more active and vigorous. "A mind diseased," in the ordinary acceptance of the term (a term we are scarcely willing, in the present state of science, to accept at all), need not imply a mind destroyed, or even deranged in all its faculties, but one changed in its normal operations by the intense emotions excited in it. Such a change, as we have before pointed out,¹ Shakespeare has given us in the character of Hamlet, with a wonderful fidelity to nature.

After these preliminary observations on the character of Hamlet, as we understand it—a character we have attempted to analyze more fully in a former essay—we approach the main idea involved in this paper, viz., the manner in which the difficulties incident to its proper delineation are met by our distinguished countryman, Edwin Booth.

That there must be a rare combination of natural gifts to meet all requirements in the proper delineation of this great dramatic creation, none will pretend to deny; and that more of these gifts are combined in Mr. Booth than in any other, now or for some time past before the public, is claimed by some of the most candid, enlightened, and intelligent critics.

These claims we here propose to analyze, and set forth some of the reasons for the faith which animates us in the supreme excellence of the delineation by our countryman.

That something of national pride should enter into and influence to a certain extent the judgment of Americans is nat-

¹ See "Delineations of Insanity," etc., p. 36, *et seq.*

ural, and perhaps not altogether unavoidable, but we hope in pursuing our analysis to divest ourselves as much as possible of this feeling, and rely upon facts, evident to all of whatever nationality, and reasonable and unprejudiced deductions from the same.

As the physical qualities necessary to the proper delineation of this character, and which are so happily combined in Mr. Booth, have been repeatedly set forth, we pass them by in this connection, and come at once to the consideration of those which more especially interest us, viz., the psychological. The truly great delineator of Hamlet must possess certain natural, mental, and moral characteristics, as well as the physical qualities above glanced at, to enable him to meet successfully all its severe requirements.

He must have not only that education in art necessary to the proper impersonation of any great tragic conception, but he must have passed through a rare and rich experience, and, to a certain extent, represent in his own life-history what he professionally portrays, and as Hamlet feel and think, "live, move, and have his being," in his daily walk and conversation. Hamlet is not something "that a man may play" successfully by merely donning the "trappings and the suits of woe," but there must be "that *within* which passeth show," a deep, rich, sympathetic nature.

The actor, of all artists, must possess such a nature, for without it there is no complete and abiding success. His heart must be attuned to every human sympathy, otherwise his impersonation is indeed a sham, and not a life-picture, as it should be. It is one thing to "speak the speech trippingly on the tongue," and another to feel its full force in the depths of his own heart. The one is merely to "split the ears of the groundlings" and obtain an ephemeral notoriety; the other is to put himself in true sympathy with thoughtful minds and feeling hearts, and permanently to control them.

Now, we are aware that these are great demands, but they are legitimate, and, as we expect to show, are met by Mr. Booth in his delineation of Hamlet in a manner most unusual, if not hitherto unequalled.

The gifts which enable him to meet these demands have, in the first place, come to him by natural descent from an

illustrious father, who was himself a man of great and acknowledged genius; and these powers were educated and developed under the eye of this parent from early youth to manhood. In the second place, these powers have been developed by an extraordinary combination of circumstances and life-experiences, so sad as to have overwhelmed an ordinary nature; but tending, when applied to such as his, to deepen the "native-hue of melancholy" which belongs to it, and bring out those tints, sombre indeed, but none the less lovely, which otherwise might forever have been concealed from view.

To an intelligent American, supposed to be acquainted with the history of the drama in his native country, and also the connection of the Booth family, not only with that history, but with the great national tragedy, in which one was, alas! the chief actor, it would scarcely seem necessary to do more than glance at these circumstances. But there are those abroad who are not as well informed in these matters; indeed, scientific journals of high standing, both in France and England, have confounded John Wilkes Booth with his father, Junius Brutus Booth, who died in 1852, and both with him whose name stands at the head of this paper.¹ Such, of course, have never reflected on the influence this crushing sorrow may have had on the full development of the powers of Edwin Booth, perfecting him in his great interpretation of this least understood, most subtle and profound, of the dramatic creations of William Shakespeare.

We now come to consider a component in the intellectual character of our gifted countryman which has, in the estimation of the writer, contributed more to his extraordinary success in the delineation of the character of Hamlet than any thing else.

Edwin Booth inherits from his illustrious father, not only great dramatic genius, but that tendency to melancholia which, as has been shown before in our analysis of the character of the father,² is so frequently an accompaniment of great

¹ See *Journal of Mental Science*, London, 1869; and *Annales Medico-Psychologiques*, Paris, 1869.

² See *Journal of Insanity*, April, 1868.

intellectual powers. But this is not all; as every man is said to be a compound of qualities, good or bad, that have previously characterized some one of his progenitors, there has descended to the son, from some ancestral source, a certain moral and intellectual balance, not derived from or possessed by his immediate progenitor. This element has been the conservative force in the character of the son—the good angel of the intellectual household, shielding him from all danger, guarding him in the hour of temptation, and guiding him through the fiery furnace of affliction so safely that he has emerged not only unscathed, but purified, strengthened, and ennobled.

We now come to consider certain epochs of sorrow in the life of Edwin Booth, in order to contrast them with those woven by the dramatist into the life-history of his immortal conception, and this parallelism is, to us, singularly interesting. The more we have reflected upon it, the more strongly have we been impressed with the thought as to how far the life-history of the delineator has tended to influence the character and success of his great delineation. Notwithstanding the free use the public claim to make of all that is most sacred in the private life of eminent public favorites, we hope to approach this branch of the subject with all the delicacy which legitimately belongs to it, especially during the lifetime of the individual.

Like Hamlet, Edwin Booth's first great sorrow was the death of a kindly, generous, and illustrious father, alone, and in circumstances peculiarly painful to his devoted family. Up to this time father and son had scarcely been separated, and although the son pleaded earnestly to accompany his father on this last journey, as he had on all others from earliest youth, he was not allowed, the father insisting on his remaining in California to pursue his profession. The farewell was forever. On the journey home he was seized, on board a Mississippi steamboat, with one of those rapidly-fatal diseases of the Southwest, and died suddenly, his only attendant being the steward of the boat.

Thus fell upon the tender and youthful heart of the son its first great sorrow, like a thunder-bolt from a clear sky, and

its traces, heightened by others in after-life, can be seen indelibly impressed on those extraordinary features, which have been the study of so many artists, and the admiration of so many thousands of every age, sex, and condition in life.

For a long time, the youth is said to have been inconsolable, brooding in silent sorrow over his irreparable loss, and,

——“with veiled lids,
Sought for his noble father in the dust.”

The noble words which Hamlet addresses to his mother, when she seeks to rally him from his excessive grief at the death of his father, seemed the eloquent and only expression of the state of mind and feelings of the youth, in view of his great bereavement:

“Seems, madam! nay, it is; I know not seems.
’Tis not alone my inky cloak, good mother,
Nor customary suits of solemn black,
Nor windy suspiration of forced breath,
No, nor the fruitful river in the eye,
Nor the dejected havior of the visage,
Together with all forns, modes, shows of grief,
That can denote me truly: these, indeed, seem,
For they are actions that a man might play:
But I have that within, which passeth show;
These, but the trappings and the suits of woe.”

The next great sorrow which overshadowed him also bore a certain resemblance to that which came upon Hamlet in the estrangement and death of Ophelia, whom, as he says, he had loved with more than the love of “forty thousand brothers.” This sorrow was the death of a wife, a woman of great personal charms and loveliness of character, and one every way worthy of that deep affection which only such a nature as his can lavish with unselfish devotion upon another. By this blow he was nearly driven to despair, but Providence, whose dealings, though sometimes dark and strange, are ever kindly, had provided a way to save him from utter desolation of heart, and, perhaps, moral and intellectual shipwreck; for such natures, without some support, cannot always, and under all circumstances, stand erect. The same blow, we believe, that deprived him of a wife, left him a tender child, upon whom to lavish the wealth of his affections, and who

can say how much dramatic art in America is indebted to this child, now a deep-eyed, brown-haired little maid of eight years?

Not long after this second great affliction he made his first deep and abiding impression upon his countrymen, by enacting Hamlet for one hundred consecutive nights to crowded houses—something unprecedented, we believe, in the history of the drama. Who can say to what extent the success of the delineation was dependent upon the recent affliction of the delineator? As the audiences looked into his sad, thoughtful countenance, the deep melancholy of which was not necessarily assumed, they read not only the history of the thoughtful, melancholy Dane of the great dramatist, but the life-history of his most truthful interpreter.

Time had barely toned down this sorrow when a calamity fell upon the nation by the hand of a younger brother, which, while it seemed for a time to threaten the destruction of the whole body politic, carried not only death and desolation, but calumny and dishonor, into the family, of which he was the acknowledged head.

Like Hamlet, he could bear up under all the sorrows death could inflict, for death involved only the ruin of his affections, and the blasting of cherished hopes; but again, like him, when, with this desolation of heart, calumny and dishonor were heaped on the head of innocence, the sorrows, not only of Hamlet, but of Job and the weeping prophet, seemed for the time to be laid upon him. We will not seek to follow him through the dark valley he was made to thread, sustained only by his strong faith in the divine order of all things, and leaning upon one friend, America's most promising sculptor, who, during the whole pilgrimage, like Faithful in the immortal allegory, stuck "closer than a brother." Neither will we seek to draw these sorrows from their abode in the breasts of the two friends, and hold them up to the gaze of a morbid, sensation-hunting public; we allude to them here only because they seemed necessary to the analysis we have undertaken, and to show with what sincerity of heart he could apply to himself the words of Hamlet he had so frequently repeated to enraptured thousands:

"O, that this too too solid flesh would melt,
Thaw, and resolve itself into a dew!
Or that the Everlasting had not fixed
His canon 'gainst self-slaughter! O God! O God!
How weary, stale, flat, and unprofitable
Seem to me all the uses of this world!
Fie on't! O fie! 'tis an unweeded garden,
That grows to seed; things rank and gross in nature
Possess it merely."

The actor and sculptor above alluded to stand in the same relation to each other as did Hamlet and Horatio, and those who know the sculptor best will be the first to admit that he possesses, in a marked degree, many of those admirable qualities of head and heart delineated by the poet in the character of Horatio which fit him for the bosom-friend of such a man. Intelligent, genial, sympathetic, watchful of his varying moods, and meeting them with an ever-ready sympathy, he has ever been to him, in all his afflictions, a tower of strength, and an inexhaustible fountain of consolation and support. Such a friendship as this Shakespeare himself must have experienced in order to have depicted it so truthfully in the case of Hamlet and Horatio.

Between the character of Hamlet, as drawn by Shakespeare, and that of Edwin Booth, as seen by his most intimate friends and associates, there are certain points of resemblance which, to those who have made a study of both, are strikingly significant. There is a strange, silent, thoughtful, melancholic mystery about both not easily penetrated, or analyzed fully. At the same time this mystery is not repulsive, but, on the contrary, it has a curious fascination, which, while it attracts with a power which is irresistible, baffles all solution and all attempts at complete analysis. "I have been long acquainted with him," said a very intelligent lady once to the writer, "but he is a strange mystery. I cannot understand him fully; he is too deep for me, but I believe he is goodness and generosity to the very bottom. I know he is, as far down as I have been able to sound him." Let any attempt, however, be made to "pluck out the heart of his mystery" by those animated by motives of interest or impertinent curiosity, and such will find themselves very soon in the same position as

were Rosencrantz and Guildenstern when sent to spy out Hamlet. They would learn that to "play on that pipe" was, indeed, *not* "as easy as lying."

Toward his intimate friends and associates, his bearing in private is marked by a refined and unobtrusive courtesy, and a quiet geniality and generosity of character and sentiment, which, if any thing, is more fascinating than any of his public performances. He seems to have laid well to heart the advice which, as Hamlet, he gives to Polonius, "Use every man after your own honor and dignity."

Every one admitted to his presence, who has witnessed his Hamlet, is made to feel at once that the bearing of the actor, in his greatest delineation upon the stage, is not all assumed, but that it belongs to Edwin Booth, the man, that he is "native here, and to the manner born." The charm which belongs to him in the character is not all dissipated, as is too often the case, by the very first utterances of the man, for the man belongs to the character, and the character to the man; the refining influences have not all been on one side, but reciprocal. The other delineations of Mr. Booth—his Macbeth, Othello, Iago, Richelieu, Sir Giles, etc.—are specimens of high art, and as such stand confessedly in the front rank; but in all these he has been equalled, and in some, perhaps, excelled; not so, however, with Hamlet; here, for reasons we have given, he stands out in bold relief. And it seems now to be the settled conviction of the best critics, that he must continue to occupy his high and well-earned position without a rival.

It is such a rare life-experience as we have here pointed out, engrafted upon great natural abilities and peculiar constitutional tendencies, that Mr. Booth brings to the delineation of this wonderful conception of the immortal bard; and we repeat, in conclusion, that such a combination of qualities, physical, mental, and moral, has seldom, if ever, been seen; and when he passes away (may the time be far in the future!) no one will remain to enact Hamlet. And it may be years before another will appear, who will bring to the delineation all that has here been noticed, fitting him to meet successfully the most severe requirements imposed upon the actor.

ART. II.—*Historical Sketch*¹ of the General Paralysis of the Insane. By M. le Dr. ACH. FOVILLE, Jr. Translated for the Quarterly Journal of Psychological Medicine, from the *Annales Medico-Psychologiques* of September and November, 1870. By EDWARD S. DUNSTER, M. D., Resident Physician Infants' Hospital, New York.

CHAPTER I.

OF THE DÉLIRE DES GRANDEURS,² FROM ANTIQUITY DOWN TO THE DISCOVERY OF GENERAL PARALYSIS.

I. It is in the works of foreign writers upon medicine that we find the most ancient examples of that form of insanity which is characterized by an exaggeration of ideas of good fortune, riches, and power. Two cases of this kind are particularly well known, and the majority of medical works both ancient and modern, relating to insanity, have either referred to or quoted them. Notwithstanding this fact, we deem it proper here to relate them at length, on account of the close connection they bear with the work we have on hand. And, by way of compensation for the lack of originality, we have

¹ This sketch is a portion of the work to which the Paris Academy of Medicine decreed the Civrieux Prize for the year 1869. The question proposed for the competition was worded as follows: "Give a clinical history of that form of insanity characterized by a predominance of delusions of grandeur, and study it from a therapeutic point of view." For the report of the prize committee, see the *Bulletin de l'Académie Impériale de Médecine*, 1870; and also the *Annales Medico-Psychologiques*, May, 1870, p. 497.

² By the concise term *délire des grandeurs*, the French, up to a comparatively recent period, indicated that form of insanity which is characterized by "singularly exalted notions and extravagant delusions of wealth and grandeur, accompanying a gradually-increasing paralysis of the muscular system." The English language has no equally terse and expressive equivalent for this phrase; and in this translation, therefore, we shall usually employ our familiar term, the *general paralysis of the insane*. Both expressions, however, are objectionable: the one, in that it brings out the striking feature of the paralysis without reference to the character of the delusions; the other, in that it gives prominence to the peculiar nature of the delirium without allusion to the attendant paralysis. *Vide infra*, p. 239, for the author's nomenclature.—E. S. D.

taken especial pains to secure for our narrative the merit of exactness and completeness.

The first of the patients of whom we are about to speak is ordinarily known under the name of the madman of the Piræus. The following is his history, as related by Claudius Ælianus,¹ according to Heraclides of Pontus, a philosopher of the fourth century before the Christian era : "Thrasyllus of Aixoneus was attacked with a new and unknown species of madness. In fact, he left the city to go to the Piræus, and while there he fancied that all the vessels which entered the port belonged to himself; he entered them upon his registers, disposing of them according to his own fancies, and rejoiced immoderately at seeing them arrive safe and sound. This disease lasted for long years. Finally, his brother returned from Sicily and intrusted him to the care of a physician by whom he was cured, and, indeed, his disease completely disappeared. He often spoke subsequently of the pleasure which he experienced during his insanity, and said that he never felt so keen a joy as when he saw these vessels, which, however, were not his own, come safely into port."

The case under consideration was evidently one of partial delirium, running into what we call at the present the general paralysis of the insane, and which finally disappeared, thanks to medical assistance; a fact which proves that even at this remote period physicians were charged with the care of partial insanity, and also that sometimes they cured it. Do we see in our day many cures obtained under like circumstances? Do we also see many patients recover to regret their former delirium, and mourn as having lost, by their return to reason, their imaginary riches?

This feeling, strange as it seems to us, is met with again in the second case we are about to cite. For it we are indebted to Horace,² and it is even more generally quoted than the preceding case; it also contains still more instructive teachings. It is as follows:

"Fuit haud ignobilis Argos
Qui se credebat miros audire tragædos,
In vacuo laetus sessor, plausorque theatro:

¹ Var. Histor., lib. iv., cap. 25.

² Epistles, lib. ii., ep. 2.

*Cætera qui vitæ servaret munia recto
More; bonus sane vicinus, amabilis hospes,
Comis in uxorem, posset qui ignoscere servis,
Et signo læso non insanire lagenæ;
Posset qui rumpem et putoum vitare patentem.
Hic, ubi cognatorum opibus curisque refectus
Expulit elleboro morbum bilemque meraco,
Et redit ad sese: Pol me occidistis, amici,
Non servastis, ait; cui sic extorta voluptas,
Et demptus per vim mentis gratissimus error."*

There was a citizen of Argos, of no mean rank, who, when the theatre was empty, would joyfully seat himself, in the best place, and listen most attentively to marvellous tragedies which he fancied he heard, and which he would approve of and applaud. In all other respects he kept himself within the strictest bounds of propriety. He was a good neighbor, a kind host, and an excellent husband, lenient also to his slaves, who might with impunity drink of the wine in his jars. A stone at his feet or an open well in his path he knew enough to avoid. Behold, however, this brave man, thanks to the labor and care of his relatives, was cured by hellebore, and restored to his reason. "Unfortunate ones!" cried he, "what have you done? You thought to cure me, your cure has ruined me. Alas, alas! who will restore to me the sweet joy and the cherished illusions which you, cruel ones, have taken from me by wresting me from my madness?"

The patient took delight in an imaginary happiness, and thus the case pertains to our subject; his delirium was of the nature of an hallucination, for he thought he heard persons who did not exist; moreover, it was partial, for the poet adduces proofs of the soundness of his judgment outside the limited sphere of his delirium; and we cannot do better than refer to Horace himself those persons who deny the insanity of this or that individual, on the ground that every thing in their purposes and conduct is not wholly unreasonable. In this case, also, the aid of medicine was invoked, and crowned with success; and, besides this, we know the cause of the affection, and the means which triumphed over it: it was the bile, and the substance was hellebore. Finally, in this instance again, the cure to the patient was a cause of chagrin

and of complaint: he preferred his dazzling blindness to the less attractive reality.

This observation, though written in vigorous verse and by a poet of the first rank, is yet very complete and instructive, which is more than can be said in many cases of the descriptions made by physicians, both ancient and modern. It has been imitated by Boileau in the following passage, taken from the fourth satire:

"Jadis certain bigot, d'ailleurs homme sensé,
D'un mal assez bizarre eut le cerveau blessé.
S'imaginant sans cesse, en sa douce manie,
Des esprits bienheureux entendre l'harmonie.
Enfin, un médecin, fort expert en son art,
Le guérit par adresse ou plutôt par hasard.
Mais voulant de ses soins exiger le salaire,
Moi ! vous payer ! lui dit le bigot en colère,
Vous dont l'art infernal, par des secrets maudits,
En me tirant d'erreur m'ôte du paradis."

To finish with the quotations from non-medical literature, we will give another history of a madman, taken from the romance of "Rasselas, Prince of Abyssinia"—a work by the celebrated Samuel Johnson, commonly called Dr. Johnson, although not a physician, and who is especially known by his dictionary of the English language.

Imlac, a man of the world, as well as a philosopher, one of the characters in the novel, is brought into frequent relations with an astronomer whose ability he admires, and whose conversation is always to him a source of pleasure and instruction. Finally, after a prolonged intercourse, he brings the astronomer into the closest intimacy with himself, and discloses to him an important secret.

"Hear, Imlac," said he, "what thou wilt not without difficulty credit. I have possessed for five years the regulation of the weather and the distribution of the seasons; the sun has listened to my dictates, and passed from tropic to tropic by my direction; the clouds, at my call, have poured their waters, and the Nile has overflowed at my command. I have restrained the rage of the Dog-star, and have mitigated the fervors of the Crab. The winds alone, of all the ele-

mental powers, have hitherto refused my authority ; and multitudes have perished by the equinoctial tempests which I have found myself unable to prohibit or restrain. I have administered the great office with exact justness, and made to the nations of the earth an impartial dividend of rain and sunshine. What must have been the misery of half of the globe if I had limited the clouds to particular regions, or confined the sun to either side of the equator ! ”

II. After these extracts from classical literature, we will confine ourselves to purely medical writings. Perhaps the obstacle which has most opposed advance in the knowledge of mental diseases, has been a lack of agreement as to the exact meaning to be given to the terms which are used to indicate such diseases. Indeed, with Hippocrates and Galen, and the mass of ancient authors as well as the majority of modern writers who have followed more or less closely the teachings of these early masters, the history of insanity is confined almost exclusively to two maladies—mania and melancholy. But these two words are far from being always taken in the same acceptation. Sometimes the first means general insanity, and the latter indicates partial insanity, of whatever nature it may be, either joyous or sad. At one time mania conveys only the idea of violence, and melancholy that of sadness. Consequently, whenever these authors have to describe an insane person with delirium of an exalted and joyous nature, and with exaggerated ideas of his goodness and importance, they have associated his disease at one time with mania, at another with melancholy, according as one or the other definition of these terms was in common usage. Thus it is that Coelius Aurelianus¹ says, in enumerating the different varieties of derangement which may present themselves in *mania* : “ This one believes himself a god ; another an orator ; a third will take himself to be an actor, either tragic or comic ; while still another, carrying in his hands a rod, will fancy himself as holding the sceptre of the world.” Again, it is in connection with *melancholia* that Alexander, of Tralles,² speaks of a woman who imagined that she supported

¹ *Morborum Chronicorum*, lib. i., cap. v.

² *De Arte medica*, lib. i., cap. 17.

the whole world upon her middle-finger, and who for this reason dared neither to bend it nor change its place. Here, then, are delirious ideas closely analogous in their nature, associated with two different diseases by the lack of a uniform definition of the same word.

This lack of exactness in the use of terms has brought about still other embarrassing contradictions, as is especially observed in the writings of Sennert. In his definition of melancholia, 'he makes fear and sadness constant characteristics, "cum timore et mœstitia,"' and yet, afterward, he cites, as an example of this disease, the case of a young man who had no other hallucination than that he believed himself the monarch of the whole earth, but who prudently abstained from taking any part in the administration of his vast empire. He is even still more inconsistent with his premises, for he says: "Certain melancholics appear as if overwhelmed by joy, when they give the reins to their imaginary fancies, and imagine themselves kings or princes, or well endowed with riches." How can we reconcile such ideas with the sadness which, according to his own definition, is an essential characteristic of melancholics?

III. However, we should state that, during antiquity, the middle ages, and even modern times down to the eighteenth century, the physicians who have written upon insanity made no mention of the *délire des grandeurs*, other than to report some special case where this sort of mental perversion existed. No one attached any theoretical importance to the cases, nor dreamed of collecting them; nor did they even ask whether it would be advantageous to make a special variety of such mental disease.

In the eighteenth century the progress which was realized in the study of natural history, and especially in the classifications of plants by Tournefort and Linnæus, had a tendency to extend to medicine, and many authors set themselves to work to imitate the botanists by ranging all kinds of disease under a precise and rigorously exact nosological system. The most celebrated of these systems is that of Sauvages. The learned professor of Montpellier includes mental diseases in his classi-

¹ *Practica medicina*, lib. i., part ii., cap. viii.

fication, and places the *vesania*, or mental derangements, in his eighth class.¹ This class comprises three orders, *hallucitationes*, *morositates*, and *deliria*. The third variety in the third order is *melancholia*: the author gives to this word the meaning of partial delirium, without indicating its nature. Farther on he takes care to say: "Those who add to this definition the statement that melancholia is always accompanied with fear or sorrow, cannot include all the varieties of this disease, for there are certainly melancholics whom we may call '*morosi*,' and who believe themselves happy." Already, then, we see that Sauvages attempted essentially to avoid that lack of precision with which we have charged Sennert, and in which other authors were equally involved; accordingly, among the different varieties of melancholia he makes one—the fifth—which, under the term *melancholia moria*, includes these joyous melancholics. As a type of it, he very naturally takes, among others, Horace's lunatic; but his quotation is neither correct nor complete. Here is what he adds of its proper characteristics:

"This variety is of the gay and pleasant sort; the patients esteem themselves happier than other men; they aspire to every thing that is elevated, and believe themselves the equals of kings, princes, and even of the gods."

"Alexander, intoxicated by the flatteries of his courtiers, believed that he was a god; but, having been wounded, he recovered from his error on seeing his blood flow—for Homer had taught that it was not blood but another fluid that circulated in the veins of the gods."

"In 1503 a student ran through various villages, crying out that he was the King of France. One sees also those who imagine themselves to be Jupiter, as, for instance, Salmoneus, who imitated the peals of thunder by rolling his chariot across a bronze bridge."

Sauvages's classification was more or less accurately adopted by his successors, but nothing new was said upon the subject with which we are now concerned. Witness, for instance, Cullen, who, having, with propriety, limited the mental derangements to Sauvages's order—*deliria*—speaks thus in ref-

¹ *Nosologia medica*, ed. Lat., d'Amsterdam, 1788, t. iii., p. 251.

erence to the melancholias, of which he admits eight varieties: "The second consists of an agreeable error regarding the surroundings of the patient. It is that which Sauvages describes as *melancholia moria*; that is to say, in this species of insanity, the patients themselves, more fortunate than other men, believe themselves to be powerful kings, or even gods."

Boerhaave, and his commentator, Van Swieten, hold to Sauvages's definition of melancholia.

We may be pardoned for not speaking of many other nosological systems, where we shall find nothing original, for example, those of Michael de Valenzi (1796), who reproduced, almost exactly, Sauvages's classification; and that of Plouquet (Tübingen, 1791), who, with excessive minuteness, detailed, for mental diseases alone, one hundred and ninety-six different names of genera, species, and varieties.

IV. While general nosology was making praiseworthy efforts to attain the dignity of a science, and to perfect its systems and methods, one might have noticed, among physicians, the formation of a specialty devoted to the knowledge and treatment of mental diseases. It is in the works of these specialists that we shall henceforth trace the progress of medical knowledge in every thing pertaining to mental derangement.

We must, however, acknowledge that, while the first school of scientific alienists in France dates from the time of Pinel and Esquirol, that is to say, from the beginning of the nineteenth century,¹ England could already, in the latter half of the eighteenth century, boast of numerous establishments, both public and private, devoted to the treatment of the insane. These establishments were under the management of highly-educated physicians, some of whom have left very interesting works, which are too little consulted in our day, and by no means deserving of sinking into oblivion. The principal of these authors are: Monro, Arnold, Perfect, Harper, Faulkner, Pargeter, Haslam, Crichton, Coxe, and Reid. We content ourselves with a mere recital of their names, referring our readers for a detail of their works to the bibliography of Friedreich.²

¹The first edition of Pinel's *Traité de la Manie* was published in 1800.
²*Literargeschichte der Psychischen Krankheiten*, Würzburg, 1880.

Among them Thomas Arnold was the first who attempted to throw off the yoke of the ancients, and to make a new classification of insanity, based upon the results of a long personal experience, acquired while superintending a private asylum at Leicester.¹ Although this attempt was not crowned with complete success, it is too deserving to pass unnoticed. Arnold considers that all mental diseases should form but one kind—insanity. This he divides into two species, according as the lesion affects the sensations or the judgment. Perhaps the designations affixed by the author to these two species have been chiefly instrumental in marring the success of this classification. He named the first *ideal insanity*, and the second *notional insanity*. Now, in our opinion, these two expressions, ideas and notions, failed to indicate, in a precise manner, the sensorial or psychical characteristic on which his distinction was founded.

Be this as it may, Arnold, among the six² varieties of his notional insanity, describes one under the name of vain or self-important insanity, or of personal importance; and the description which he gives of it forms the most complete and exact picture of the *délire des grandeurs* which had been drawn up to that period. We shall, therefore, reproduce it unabridged:

“They who are possessed with it,” says he (vol. i., p. 171), “have a very exalted opinion of their own imaginary dignity, consequence, opulence, elegance, and finery of dress, charms of person or manners, sense, learning, or of some other valuable quality, with which they suppose themselves dignified or adorned.”

“The characteristics of this kind of insanity being either an excessive and even childish vanity, or a serious and sometimes a solemnly ridiculous self-importance, its appearances are as various as may be the objects and forms of absurd pride or silly vanity, and display themselves in the exhibition of almost every conceivable variety of preposterous pomp and puerile affectation.”

¹ “Observations on the Nature, Kinds, Causes, and Prevention of Insanity.” Second edition, London, 1806. 2 vols. in 8vo.

² This is an error, probably, of copying, as Arnold makes nine varieties of his second division, *notional insanity*. —E. S. D.

"Those, therefore, whose insanity is of this kind, discover it in an excessive attention to dress and ornament; and are either led by vanity to a solicitous neatness in their persons and attire, of the charms of which they appear sufficiently conscious; or, what is not less common, render themselves completely ridiculous by adorning themselves in the most trifling, tawdry, and fantastic taste, by the most childish self-admiration, and by every kind of gesture which can indicate the prevalence of consummate vanity; in the most romantic talk of their own wealth and possessions; in stateliness of gait, voice, and manner; in vast affectation of science, sagacity, and learning; in perpetual effusions of nonsense for knowledge; in an ostentatious display of scraps of Greek, Latin, French, or other languages, which they repeat upon every occasion, without much regard to sense or propriety; and even in the uttering of an unmeaning jargon, which they wish to pass upon their hearers for specimens of their great attainment and wonderful skill in the languages."

Arnold supplements this description with a case borrowed by him from the work of Thomas Bonnet.

It may be remarked in this description that, although the author does not establish any divisions in his "vain or self-important insanity," he nevertheless lets it appear that it may offer two types, in one of which fixed and systematic ideas predominate, while in the other every thing is puerile and confused, and seems to argue a certain enfeeblement of the faculties. We can hardly escape observing here an indication of the distinction which had already been forcibly suggested to the mind of the writer, and which, in modern days, has been formulated in a more clear and precise manner.

The same distinction is found even still more clearly in another part of Arnold's work.

When speaking of the immediate causes of insanity, he touches again on this form of derangement, and observes (vol. ii., p. 308): "Vain or self-important insanity usually proceeds from a considerable degree and inveterate state of the fourth cause [change in the intimate and invisible texture of the medullary substance of the brain], and is incurable; and is then not only permanent, but pretty uniform, and has few

deviations, rarely any great amendment, and no perfect intermissions. But there are cases in which it is less constant and unyielding, and has longer or shorter intermissions, though it is still liable to returns which are not uncommonly pretty frequent, and seldom leaves the mind in the interval in a perfectly sound and rational state. In these cases it may be owing *in part* to the fourth [explained above] cause, but is probably more indebted to the second [venous congestion without increase of arterial activity], which, giving way in time to proper medical exertions, leaves the mind in a state which cannot justly be considered sound, and yet so nearly approaches to sanity, that it ought, rather, perhaps, to be termed unsteady, than insane. When this less obstinate but commonly more violent sort of self-important insanity is at its height, it always associates with the second and fourth cause some portion, and often a very large one, of the first [an undue acceleration of the arterial circulation of the brain, producing turgescence, compression, and an approach to inflammation], and frequently terminates in some species of ideal, and often arises into a very high degree of phrenitic insanity [fury]."¹

Here the distinction is very clear. On the one hand, cases of fixed, obstinate, and permanent derangement, without improvement or real intermission, in which there is no disturbance in the circulation, but only a minute alteration of the structural elements of the brain, which the writer admits evidently hypothetically, and not from direct ocular proof; on the other hand, cases in which the derangement is variable, at one time considerable, at another barely perceptible, and in which, even during the most favorable intermissions, the mind is only apparently sound, and retains an under-trace of weakness; this last variety being ordinarily of a violent nature, and at times reaching even a state of fury; and when he is engaged in determining the causes, side by side with a certain degree of this internal deterioration of structure which is admitted by him, and certainly with reason, he points out

¹ The author has paraphrased rather than translated some portions of this extract from Arnold. I have preferred to quote Arnold's own words, explaining the causes which he refers to by numbers, by the words enclosed in brackets.—E. S. D.

the cerebral hyperæmia, the turgescence almost amounting to inflammation. What is there wanting in these descriptions for the recognition of two very distinct maladies, varying only in the form of the delirium with exalted ideas, and in the difference of the state of circulation, which, in the one, remains apparently normal, while in the other it presents hyperæmia and congestion? Absolutely nothing but two different names. We think, therefore, that we are only just in affirming that Arnold recognized in his patients—with whose state he was evidently thoroughly acquainted—certain distinctions which were only fully perceived at a much later period.

His medical contemporaries, devoted like him to the treatment of sufferers from mental alienation, did not adopt his opinion, nor do we find in any of their works any theoretical ideas on the *délire des grandeurs*, with the exception of a lengthy and not very exact description by Crichton ("Enquiry on Mental Derangement," London, 1798, vol. i., p. 181), and of a tolerably caustic passage from a pamphlet by John Reid ("Essay on Insanity," London, 1816, p. 33).

"Egotism," says he, "when combined with hypochondriasis, often leads a man to form too high a notion of his bodily as well as of his intellectual stature. It is no very uncommon thing for an hypochondriac to fancy himself too big to get through a door; but I recollect no instance in which an invalid of this class has conceived that he was small enough to pass through the key-hole. In the imagination of such patients, the pictures of themselves, when not correctly drawn, for the most part are larger than life."

In default of theoretical opinion, many cases of mental derangement, in which ideas of grandeur predominate, are to be found in the writers of the period in question.

Perfect ("Annals of Insanity," 3d edit., p. 49) gives four of them, one only of which came under his own personal observation; the second was communicated to him by one of his own profession; the third was borrowed from De Wier (*De Præstig. Dæmon*, lib. 13, *de Lamis*, cap. 7); while the last was copied from a political paper of the day.

In Haslam's work some cases are to be found in which he points out the predominance of the idea of greatness ("Obser-

variations on Insanity," London, 1798, obs. xv., xviii., xxiii.), but these are merely isolated facts, and he introduces them without any attempt to interpret them or reduce them to system.

Chiarugi, in Italy (*Della Pazia in Generale ed in Spezie*, Firenze, 1793-'94, vol. ii., p. 12), falls back into the erroneous views of Sauvages. He admits several forms of melancholia, one of which, termed by him false melancholy (*melancholia spuria*), is characterized by hallucinations which, instead of being of a sad and unpleasing nature, bear on the contrary the stamp of joyousness and security. "I have never known," he observes, "any felicity more complete than that of the individual who believes himself to be happier than all other men, imagining himself to be a god, a prince, etc." As regards illustrations, he confines himself to quoting the case described by Horace.

It was doubtless with the view of meeting the same indications as those of Sauvages and Arnold, that Dr. Rush ("On the Diseases of the Human Mind," New York, 1812) coined the term *amenomania*. It was, however, impossible for us to procure his work, and it is with regret that we are compelled, as far as he is concerned, merely to mention its title.

V. In France, the school of medical men devoted to the study of mental alienation may be considered as dating from the reform introduced at the Bicêtre in the mode of life and treatment of the insane by the illustrious Pinel.

In his medico-philosophical treatise on mental alienation (Paris, 2d ed., 1809), Pinel speaks on several occasions of *délire ambitieux*. In the first place, in his general remarks on the physical and moral characteristics of mental alienation, he brings forward several examples of this kind of mental derangement (pp. 108, 109, 119); and then, as regards its classification, he approaches very nearly that of Sauvages, Cullen, and Chiarugi. "Nothing," he observes, "is more inexplicable, and yet nothing is better proved, than the two opposite forms which melancholia may assume. It is sometimes a puffing up with pride, and the chimerical idea of being possessed of immense wealth and of boundless power; at others it is the most pusillanimous dejection, the deepest consternation, or even a state of despair. Here follow some examples of these two

kinds of insanity. Thus, as far as Pinel is concerned, the term melancholia has resumed the sense of partial derangement, whether its nature be joyous or sad.

Fodéré is of quite a different opinion. He cites examples of vainglorious insanity, but he refers them to mania, and places them in opposition to the delirious manifestations of the melancholic type.

"Maniacal insanity produced by ideas of glory, wealth, happiness, and contentment, such as that of which I have just produced examples, has," he observes, "no connection with melancholia, and is entirely opposed to it."—(*Traité de délire*, 1816.) Here we find ourselves once more in the state of confusion which we have already remarked in Hippocrates, Galen, and the imitators of their school.

Dubuisson, treating of partial derangement, remarks that, among those affected by it, there are some who are carried by it into a boisterous gayety, into verbosity, and into an exaggerated enthusiasm; who flatter their imagination incessantly with ideas of happiness, good fortune, and prosperity; fancying themselves to be men of learning, artists of celebrity, or monarchs. "We may well conceive," he observes, "that the term melancholia is by no means applicable to this nervous affection, which necessitates another nomenclature more appropriate to this kind of derangement—such, for instance, as the term *monomania*." Farther on he subjoins in a note: "Dr. Esquirol has employed this denomination in several of the interesting articles contributed by him to the *Dictionnaire des Sciences Médicales*, but I have not observed, up to the time of writing this, that he has applied it in any precise and definite manner."

At length we reach the works of that celebrated physician, approaching at the same time the epoch of the discovery of the general paralysis of the insane; that is to say, as M. Bailarger with reason affirms, "of the greatest progress which can be pointed out in the history of mental diseases." This discovery is purely a French one, and appears, like many others, to have been the collective result of a phalanx of several observers laboring simultaneously in a common field of study, rather than the personal conception of a single man. That

phalanx was composed of Esquirol and his pupils. But, before speaking of the newly-recognized disease, and attributing to each his own proper share in its discovery, it is well to ascertain what were the opinions of the master himself, at a time when the question of the general paralysis of the insane had not yet been mooted.

At the very outset, Esquirol had proposed to remedy the confusion which prevailed in the nomenclature of mental diseases; but his first attempts were full of hesitation, and his different publications mark the successive stages by which his ideas advanced.

Let us commence with the article *Folie*, published in 1816 (*Dictionnaire des Sciences Médicales*, vol. xiv.). In the purely descriptive portion of that work, Esquirol assigns considerable space to the ideas of grandeur. "Every asylum for the insane," he observes, "has its gods, its priests, its faithful, its seids; it has its emperors, its kings, its courtiers, its ministers, and its generals. One believes himself inspired by God, and in communication with the Holy Ghost. Another, bold and audacious, rules the universe, and wages war against the four quarters of the world. A third, proud of a self-assumed name, looks down with disdain on his companions in misfortune, lives isolated, secluded from others, and preserves a seriousness as sad as it is vain. A last one, in his ridiculous pride, imagines himself possessed of the science of Newton, or of the eloquence of Bossuet" ¹ (page 152).

Having finished his description, Esquirol wished to classify, and, with a view of obviating the confusion formerly existing, he invented a new term—*monomania*; but, as Dubuisson justly observes, in the passage we have just quoted, he does

¹ In another place he quotes the history of the madman of the Piræus, and makes an observation which is appropriate to his case, and which he points out as exceptional, because after his cure the patient expressed his regret at being deprived of the imaginary wealth with which his delirium had deluded him. "This happy state of some insane persons," he adds, "has been the cause of much error about patients. For some have concluded, from certain cases that they have seen, that all the insane would be happy and would not suffer, whereas generally they do suffer as well physically as mentally." We have made a similar observation at the commencement of this chapter.

not appear to me to be very sure himself as to the precise meaning to be attributed to this word. In fact, on the one hand, in his enumeration of the forms of insanity, he instances, as one and the same form, "the monomania or melancholia, in which the derangement is limited to a single object, or to an inconsiderable number of them" (page 163). That is to say, that, agreeing in opinion with Sauvages, he attributes to melancholia all partial derangement, whether sad or joyous; but, perceiving the inconvenience of comprehending these opposite states under a name which in its ordinary signification implies the idea of sorrow and dejection, he proposes to replace it by a new name, which only expresses the limited nature of the delirium, without giving any presumption regarding the kind of the dominant ideas. But, on the other hand, he had observed, a few pages back, "The passions of madmen are impetuous, more particularly in mania and monomania; in melancholia they are sad." In other words, in the above he contrasted monomania with melancholia, regarding them as two different forms of insanity, the former being characterized by impetuosity, while the latter is stamped with sadness. There is, then, an evident contradiction between these two passages, and we are bound to state that Esquirol in this article contributes his fair share to increase the confusion he wishes to avoid, since, by the side of the word *melancholia*, the sense of which is badly defined, and to which he attributes successively two opposite significations (delirium of a sorrowful nature, page 159; and partial delirium of a sad or gay nature, page 163), he introduces a new term, *monomania*, to which he unfortunately does not give a more precise meaning; for, on page 159, he employs it to denote an impetuous form of delirium in opposition to melancholia, and on page 163 he employs it as synonymous with the latter, and as a collective designation of all limited deliria, whether gay or sad in their nature.

Three years later, in 1819 (article "*Monomania*," vol. xxxiv. of the same Dictionary), Esquirol seems actuated by a desire of attaining greater precision. After having repeated the two definitions of the word *monomanie*—which he had previously given—that of a partial derangement in general,

and that of partial derangement of a gay kind (*melancholia moria* of Sauvages, *amenomania* of Rush), and having laid considerable stress on the confusion existing in the majority of the terms employed to denote mental diseases, he proposes entirely to abandon the word *melancholia*, and to divide partial derangements into two varieties; one of these he calls *lypomania*, comprehending partial deliria of a sad and depressing nature; the other comprehending partial deliria of a gay and beaming nature, and to which he confines the sense of monomania. He gives his reasons for this distinction as follows: "The two forms of mental derangement or delirium, and the symptoms which make a difference between them, do not permit their being designated under one and the same name, more especially if we wish to introduce into the nomenclature of mental diseases the same critical accuracy which it is our duty to employ in the study of the diseases themselves" (p. 116.)

This precept is excellent, and this reform might have been most salutary had it been universally adopted and put into practice. But how could this be the case, when the inventor himself appears at the end of a few pages to have forgotten what he had just said? In point of fact, in the same article, we find comprised under the name of monomania, and as constituting so many different varieties of that affection, the great epidemics, with choreic convulsions, of the middle ages, especially that observed in Holland in 1373, under the name of St. Vitus's dance, demonomania and theomania, erotomania and nymphomania, and even the kinds of insanity which have a suicidal or a homicidal tendency.

In truth, now we behold ourselves far away from the original definition, according to which the pathognomonic characteristics of this malady must of necessity always be excitement and gayety.

We cannot, therefore, be surprised at the discussions which have since arisen as to the notion to be conveyed by the term monomania, and its legitimate employment, since its inventor could not always agree with himself in the sense in which it was to be used. Further, we must regret to be obliged to observe that this newly-coined word has by no means an-

answered the expectations of Esquirol in banishing that confusion of language and obscurity which had prevailed up to his time, and which we have pointed out in the opening paragraphs of this chapter.

VI. To sum up, then, if we take in at a single glance the history of medical teaching from the times of remote antiquity down to 1820, the date of the discovery of the general paralysis of the insane, we perceive that writers have *always* recognized the existence of the *délire des grandeurs* and have reported instances of it; but that as a general rule they never thought of making it the characteristic of a distinct kind of insanity, and merely regarded it as an accessory symptom connected with mania by some, with melancholia by others, according to the meaning which each attributed to these two names of diseases. Some medical men, however, conceived the idea of considering this kind of delirium as characteristic of a special form of insanity, among whom some (Sauvages, Cullen, Chiarugi, Pinel) have only made it a variety of melancholia; others have given it a perfectly distinct name (vainglorious insanity of Arnold, amenomania of Rush). Lastly, Esquirol—if we may judge from certain passages in his writings—would appear to have wished to have made the delirium of a grandiose nature the distinctive characteristic of what he called monomania; but this restricted acceptance of the term he did not even himself faithfully respect, for in other passages of his own writings he extended the meaning of monomania to all partial derangements of the mind, and this latter acceptance of the term has since prevailed.

CHAPTER II.

DISCOVERY OF GENERAL PARALYSIS OF THE INSANE.—WORKS AND DOCTRINES OF BAYLE.—MORBID INDIVIDUALITY OF THE DISEASE.—SPECIFIC VALUE OF THE DÉLIRE AMBITIEUX.

I. THE signification of the predominance of the delirium of a grandiose nature in insanity and the discussions on the importance due to that symptom date from the discovery of the general paralysis of the insane, and from the appearance

of the works of Bayle. Now that we are acquainted with the opinions enunciated on this subject from remote antiquity down to 1820, we are enabled to enter upon this study with minute details, in order to show clearly how it has been finally settled in the present day. In this study we shall derive considerable assistance from two memoirs by M. Baillarger, published in the "*Annales Medico-psychologiques*." One is entitled "*De la Découverte de la Paralyse générale et des Doctrines émises par les Premiers Auteurs*" (1859, p. 509, and 1860, p. 1). The other is styled "*De la Folie avec Prédominance du Délire des Grandeurs dans ses Rapports avec la Paralyse générale*" (1866).

This general paralysis, a glimpse of which was caught by Haslam, which was rather surmised than discovered by Esquirol, and described by his pupils Georget, Delaye, and Calmeil, has been regarded by all these authors as a simple complication of insanity, consisting only in lesions of the movements—lesions which, by Esquirol, are designated under the name alone of "paralysis;" by Georget (1820), under that of "chronic muscular paralysis;" by M. Delaye (1824), under that of "general incomplete paralysis;" and at length by M. Calmeil (1826), under that of "general paralysis of the insane." This last denomination, though not deemed altogether faultless, even by its inventor himself (*Paralyse chez les Aliénés*, p. 9), is the one which has remained most generally in use.

II. Bayle, writing at the same period as the above-named authors, treated the subject in a manner materially differing from them. His teaching on general paralysis is explained in three works, in which it is reduced to form in a more complete and absolute style.

In his thesis (*Recherches sur l'Arachnitis chronique*, 1822), instead of regarding the troubles of the intellect and those of motility as two different diseases, he takes upon himself to demonstrate that they are two orders of symptoms, developing themselves in a regularly parallel manner, depending on a single cause, and belonging to one and the same disease, which he terms "chronic arachnitis" (p. 25), inasmuch as he already regards it as an inflammation of the meninges.

At the same time that he proclaims the unity and the individuality of the affection, he does not fail to remark that the delirium or mental derangement in this disease is distinguished by "dominant ideas." He does not as yet give a distinctive name to these ideas, but in his special details of cases he emphasises them, and they are all of an ambitious nature. Further he already traces the distinction of the disease into three periods, and insists on the pathogenetic importance of the cerebral congestion.

In his next treatise (*Nouvelle Doctrine des Maladies mentales*, 1825), Bayle develops his division of *délire* into three successive periods, the first of monomania, the second of mania, the last of dementia; but in addition to this he specifies the nature of the mental derangement. We give the principal passage of this description in full, on account of the historical importance which attaches to it.

"This disease commences with a state of ambitious monomania and excitement in a greater or less degree, which, combined with a slight, incomplete, and general paralysis, are the essential characteristics of this period. The sufferers imagine all at once that they are rich, powerful, exalted in dignity, and covered with distinctions and titles. Some of them fancy their fortune to be doubled, tripled, nay, increased a hundred-fold; others, forgetting their original state of misery when first deranged, think of nothing but of the treasures of which they deem themselves possessors; they form gigantic projects which are to produce them enormous sums; they buy whatever falls in their way; they are entirely taken up with the acquisitions they cannot fail to make.

"Under the domination of these ideas they talk of them incessantly, and think of nothing else. Their babble is inexhaustible; they heat themselves while speaking, and are easily excited to rage, when they are opposed regarding their extravagant ideas. Their countenance is generally ruddy and beaming, and expresses the satisfaction and joy caused by their wealth and grandeur. They sing and laugh, and are in a remarkable state of hilarity and gayety. Their answers to questions not bearing on the special subject of their hallucinations are, for the most part, tolerably reasonable."

Finally, in his grand work (*Traité des Maladies du Cerveau et de ses Membranes*, Paris, 1826), Bayle reasserts and develops his theory.

As regards the initiatory period, he describes the monomaniacal and grandiose derangements in the same terms we have just quoted, adding to them, however, some supplementary developments; and then, in proportion to the progress of the disease, he shows "the peculiar ambitious variety of delirium becoming more extended, more vast, more gigantic, and more dominant. Later on, the patients imagine themselves to have reached the height of opulence and grandeur. They possess hundreds of thousands, millions, even milliards of francs, safes full of gold, diamonds superb and incomparable, magnificent dresses, castles, cities, kingdoms, or even the entire universe. They are ministers, generals, admirals, princes, kings, emperors, or even the Deity Himself; they distribute honors on all sides, recompense their followers, and appoint the persons who are about them to the highest charges in their kingdom" (p. 498).

By the side of these symptoms of derangement there exist signs of dementia.

Other patients, at the same period, remain tranquil. "In that case their state is ordinarily as follows: they are under the domination of a fixed ambitious delirium; they can talk with tolerably good sense, and connectedly, on any other subject; their faculties, especially the memory, are impaired" (p. 500).

This description is given as applying not only to the majority of cases, but to all; no restriction is placed upon their general nature.

For the second period, the same special character of derangement. "The symptoms which constitute this period are those belonging to mania, that is to say, a more or less general delirium or mental derangement, with predominance of ideas of an ambitious character, and a state of excitement, of agitation, or of fury." Here follow the particulars of these ideas of grandeur.

Lastly the third period, or period of dementia, is essentially characterized by a "very considerable enfeeblement of the in-

tellectual faculties, an obliteration more or less of the ideas, with a predominance of those relating to wealth and grandeur" (p. 504).

For these two periods, as well as for the first, the *délire des grandeurs* is indicated as a rule common to every case, or at least the question of any exception is not raised.

Further on, resuming his description, the writer observes: "To whatever height the mental alienation may have reached, whether it manifest itself under the form of monomania, mania, or dementia; whether it be tranquil, or accompanied with excitement more or less violent, it is always, or almost always, distinguished from other kinds of insanity, during a part or the whole duration of its course, by dominant ideas of wealth, power, grandeur, etc." (p. 437). This passage, at the same time that it is the one usually quoted by more recent writers as expressing the teaching of Bayle, is additionally remarkable as containing the words, "*or almost always*," added for the first time as a corrective to the existence of ideas of grandeur—a corrective which, as we have seen, had not been mentioned in the preceding more detailed description.

Again, we meet with a passage which develops the one quoted above, and displays in a clearer light the author's idea. Speaking of the existence of this *délire des grandeurs* among patients affected with chronic meningitis, he adds: "The exceptions are quite rare; still they are often found in subjects who, owing to circumstances, could not be observed from the invasion of the disease, and as the information respecting previous symptoms is not always complete, and as the ideas of which we are speaking will sometimes disappear in the last period, it is plain we are liable to deceive ourselves by concluding that they have not existed in the first two stages" (p. 547).

This passage shows how constantly, in the opinion of Bayle, the *délire des grandeurs* accompanies chronic meningitis. He commenced by affirming that it always existed, and if, out of respect for facts, he acknowledges that patients are sometimes met with who manifest nothing of the kind, he explains this apparent contradiction by saying that the symp-

tom with them has been a transient one, it is true, but that it existed at the commencement of their affection, before they were submitted to competent medical examination. We do not, therefore, attribute to him an opinion he did not avow, but only express the very foundation of his teaching when we assert that he regarded the ambitious delirium as a constant symptom of this disease, and common to all affected by it.

He further regards it as exclusive, and consequently as absolutely pathognomonic; for, when the establishment of the differential diagnosis of chronic meningitis is in question, the only sign, taken from the state of the intellect, which, in his opinion, distinguishes it from all other mental maladies, is that the latter do not present "dominant ideas of an ambitious character."

III. It results from this analysis of the works of Bayle that this author has affirmed the two following facts, which belong to him exclusively, and form the foundation of his doctrine:

1. General paralysis is a special malady, a morbid entity by itself, presenting, at one and the same time, troubles affecting both the intellect and the power of motion; and it is not the combination of two different diseases, of which the one, purely muscular, might come, at any moment, to join itself to the other purely mental, and previously in existence. It is what we shall call the morbid individuality of general paralysis.

2. In this malady, the ambitious variety of delirium constitutes a necessary and sufficient intellectual symptom: necessary, for it exists in every case; sufficient, for it does not exist in any other. Consequently, from the existence of the disease, that of the symptom may be concluded, and the existence of the symptom suffices in its turn to lead us to conclude that of the disease. It is what we shall call the specific valuation of the *délire ambitieux*.

These two assertions are at the bottom of almost all the discussions on the subject of General Paralysis, and we shall see that but little remains of the second in the present day, and that the first still meets with the most determined opposition. This is, however, no reason why we should refuse our homage to the works of Bayle, for they have made a decided

progress in science, and it may be that the ardor with which the study of this disease has been pursued since his day, and the exactness which has been brought to bear on the critical examination of all its symptoms, are chiefly owing to what was too positive and too systematic in his teaching.

IV. The theoretical description of general paralysis, given by Bayle, is substantiated by a great number of particular cases. His treatise of 1826 contains sixty-three entirely original ones, which, with the comments accompanying them, form by far the most bulky portion of his book. We shall avail ourselves of this circumstance to submit, first of all, his ideas to the test of the facts on which he has founded them himself:

In the first series, all the cases answer to the general description drawn by Bayle of the affection, with the exception of the fifteenth, in which there was no ambitious delirium; but in this case the disease had taken very rapid strides, approximating to acute delirium, and death had supervened at the expiration of twenty-four days. At the *post-mortem* examination the lesions of general paralysis were found clearly marked, and the rapidity with which these can declare themselves is an interesting fact, to which, from this time on, we invite attention. In the reflections which follow this case Bayle observes: "The *délire ambitieux* was not observed in the patient; but the coma was too intense to permit of its manifestation. It would probably have made its appearance in due course if the patient had lived longer, or if the sanguineous congestion of the pia mater had diminished." We acknowledge that the rapid progress of the disease makes it out of place to attach great importance to the absence of specific delirium in this case.

In five other cases (2d series, 1, 6, 8, and 4th series, 6 and 7) there was also absence of all delirium of the ambitious type during all the time the patients were subjected to observation; but, as regards the last two, the dementia was absolute at the time of their admission, and it was impossible to gain any information respecting their antecedents. It is very allowable to admit that they might have presented the *délire ambitieux* in a less advanced stage of the disease. For

the three others, the same explanation may be brought forward; but we will remark that, in these three cases, the existence even of general paralysis may be considered as doubtful. For Bayle—who, in this disease, sees nothing but a chronic meningitis—a lesion of the envelopes of the encephalon was a sufficient reason for the insertion of these cases in the framework of his book; but we are more exacting in the present day, and could not admit unreservedly, as examples of general paralysis, cases in which the meninges were thickened and resistant, and the serum in the ventricles and sub-arachnoid space was very abundant, but in which the membranes were quite free from the cerebral surface, and did not present any adhesions to it. These circumstances, and several other details, induce us to think that the case was only a simple dementia, dependent on some primary cerebral affections, characterized by the thickening of the meninges, and by a cerebral atrophy which had determined, as an offset, an exaggerated accumulation of the cerebro-spinal fluid, and in which the diagnosis had been rendered obscure by the very advanced state of mental and physical enfeeblement of the patients during the period of observation.

In the examination of this question, we disregard the observations in Bayle's fifth series, because they appear to us—at least the majority of them—to be cases of localized softening, with consecutive dementia, rather than cases of general paralysis.

On the whole, as regards the *délire ambitieux*, the opinions of the writer meet with no real contradiction from the cases he has published.

But there is one particularity with which we were struck in the perusal of these cases, and which appears to us to deserve notice. In his theoretical description of general paralysis, Bayle never mentions any intellectual troubles, except the delirium of the ambitious type, and dementia; whether existing together or one predominating over the other, these two symptoms still constitute the only psychic accidents which he indicates. Among the cases, however, there is a sufficiently remarkable proportion in which the patients presented in addition the melancholic type of delirium. The existence of

this form of mental trouble in general paralysis having since formed the subject of an important discussion, we think it our duty to dwell on it a short time.

The eighth observation of the third series relates to an insane paralytic, who, during the whole course of his malady—more than four years—had very frequent attacks of an epileptiform nature. He was for the most part very calm, and under the domination of exaggerated ideas with relation to his fortune; but, after his attacks, he fancied for several days that it was intended to poison him; that the cooks served him, instead of proper food, a mixture of opium and hemlock, and he displayed a feeling of general mistrust; at the same time he suffered pains in his stomach, followed sometimes by acid eructations. In order to explain this melancholic delirium, frequently returning in the course of general paralysis, and with the view of showing that it forms no part of the disease, the author gives himself incredible trouble. He is dealing with a man whom he regards insane as long as he calls himself happy and contented, and does his best to prove that, when after his convulsive attacks the same man displays distrust, and deems himself persecuted, he reasons in a logical manner, although, perhaps, permitting himself to be swayed too much by exclusive ideas. “M. M—— had,” he observes, “just reasons for believing that his relations and others had designs upon his fortune; he was aware that opium and hemlock produced sleep. It was then he was seized with an attack of an epileptic nature; recovering, he saw himself surrounded by persons whom he regarded as his enemies; he learned that he had remained twelve hours in a state of coma; he drew the conclusion from this that a soporific potion had been administered to him, in order to deprive him of his senses and enable others to take possession of his property while he was in a state of sleep. He shortly afterward suffered from delirium, and it was necessary to confine him at Charenton, which confirmed his first suspicions. Some time after this he began to be subject to an intense pyrosis, which was to him a fresh proof of the attempt to poison him. His attacks returned, and he inferred from them that his keepers had been bribed, and were in the habit of adroitly giving him pills com-

posed of opium and hellebore; as, in addition to this, his faculties were very feeble, it was impossible to dissuade him from this series of false ideas, which, however, were connected with each other in a logical manner." How far may not a prejudiced observer be drawn by ideas wedded to a system, and what *délire ambitieux* or other could resist such mighty efforts of indulgent interpretation!

Besides this case, the melancholic type of delirium is noticed in seven other cases, and in all of them it presents a consistent character, eminently calculated to strike the attention—that of having existed at the commencement of the affection, and of having preceded for some time—generally some months—the appearance of the *délire ambitieux*. (2d ser., obs. 8th; 3d ser., obs. 14; 4th ser., obs. 2, 3, 4; 6th ser., obs. 3, 4.) Notwithstanding this, Bayle does not attribute any value to this symptom; four times he does not say a word about it in his comments, which, however, enter into minute particulars, accompanying each case; three times he mentions it only to say that it is not connected with the disease. "The exclusive delirium, which lasts some time, cannot be regarded as an effect of chronic meningitis" (page 241). "The attack of mental alienation had been preceded by a state of hypochondriasis, which seems to have had an intimate connection with the cerebral affection with which the patient was attacked later on . . . but, taking into consideration that the patient had been attacked with gastritis, of very long standing, we cannot place any great confidence in this conjecture" (p. 266).

"The two fits of melancholia with which the patient had been attacked at the period when he began to show symptoms of chronic meningitis were of a different nature from this last disease" (page 364).

We have dwelt at some length on these details of cases, because they permit us to complete the teaching of Bayle on general paralysis, and, to what he has formerly stated on the subject, to add what evidently may be gathered from his book, though it may not have been propounded in a positive manner. In point of fact, in eight cases out of sixty-three, or, in other words, in the proportion of one to eight, the patients whose history Bayle has collected have presented the melan-

choly delirium, and in seven of these cases this derangement, preceding every other symptom of intellectual disturbance, has marked the commencement of the disease. The writer, however, has allowed this fact to pass unperceived, or he has only noticed it in order to show that, in his own opinion, it was foreign to the disease itself; and in his theoretical description of the latter, he has not even mentioned it, as if he were bent on allowing nothing to detract from the predominant value attached by him to the *délire ambitieux*. Having more experience in the present day, we can afford to be less partial: we know that the melancholic type of derangement often forms a part of the intellectual disturbance of general paralysis, especially at its commencement, and that when it exists it ought to be reckoned in the number of the symptoms peculiar to that affection.

Before leaving Bayle's work, let us mention one more case which bears upon an important point of doctrine (1st ser., obs. xi.): "It presents," observes the author himself, "a fact which distinguishes it from all those we have examined up to the present moment, which is, that during the first four months the patient did not present any kind of incomplete paralysis in his tongue or lower limbs. Although this was the first case of the kind coming under our notice, the *délire ambitieux* was so advanced and so dominant, the excitement had such a form, that we suspected thenceforth that the patient was attacked by chronic meningitis." The event confirmed this suspicion, and should have encouraged Bayle to consider the ambitious type of derangement as sufficient to establish the diagnosis of general paralysis. We shall see, farther on, that the embarrassment caused by analogous cases is very frequently met with in practice, and that it is often difficult to give a decided opinion on this point.

It has probably been remarked that Bayle, in his description of general paralysis, after having spoken of the ordinary commencement of the disease, under the form of monomania of the ambitious type, with excitement, speaks of other patients who at that stage of the affection remain tranquil and composed, but lose their memory and their faculties, and are swayed by a fixed ambitious delirium. This passage, which

does seem to have attracted much attention hitherto, evidently lacks in clearness, and we could wish to know more exactly what the author really meant by this *délire ambitieux fixe*. We were in hopes of being enlightened on that point by perusing some particular reports of cases presenting this peculiarity, but we have gone through the whole collection without finding a single one. What we do find are some cases in which the *délire ambitieux* displays little activity, not manifesting itself spontaneously, but only when the patients are questioned, and when it expresses itself in an ill-defined manner. Bayle on such occasions states that the ambitious ideas are not dominant; nowhere does he say that they are fixed, and we are driven to the conclusion that, if he ever saw any of these patients under the dominion of a fixed ambitious delirium, he has omitted to record their history.

V. The works of Bayle on general paralysis gave, as we see, an importance hitherto unknown to the *délire ambitieux*—that of being the specific symptom of this disease. We may sum up his teaching as follows: general paralysis, or chronic meningitis, constitutes a morbid entity by itself; and the ambitious delirium, combined with dementia, constitutes, in a mental point of view, the pathognomonic symptom of the disease.

In fact, this derangement is not observed in any other form of mental alienation, and in this one it is always produced at one period or another of the affection.

If, by chance, it appear to be wanting in certain patients, it is either because the progress of the disease has been so rapid that it has terminated in death before this specific sign had time to be developed; or, because it has been transient and only existed at the commencement, before the patients were subjected to examination by a competent physician. This symptom is of such importance that, even when it exists alone at the commencement of the affection, it suffices, in the absence of all muscular disturbances, to lead to its recognition.

When in this disease a derangement of the melancholic type is manifested, the latter is foreign to the affection, and should not be reckoned in the number of its symptoms.

Lastly, Bayle speaks of some patients who are composed

and under the dominion of a fixed ambitious delirium; but he gives no report of a case answering to this variety of the disease.

CHAPTER III.

OBJECTIONS TO BAYLE'S DOCTRINE.—DISTINCTIVE CHARACTERISTICS OF DÉLIRE AMBITIEUX IN PARTIAL INSANITY AND IN GENERAL PARALYSIS.—CONGESTIVE MANIA OF M. BAILLARGER.—EXCEPTIONAL CASES WHOSE DIAGNOSIS IS DIFFICULT.

I. The positive ideas propounded by Bayle, which we have set forth in the preceding chapter, immediately roused opposition.

Georget especially attacked Bayle with considerable violence, and, we must say, in a manner oftentimes unjust. In what, however, regards the specificity of the *délire des grandeurs* he allows (*Archives générales de Médecine*, vol. xiii., p. 323) that "it is very true that the majority of paralytic lunatics have an ambitious monomania;" but in the following page he diminishes the value of this proposition by saying: "There are among the insane ambitious monomaniacs without paralysis, and general paralytics without ambitious monomania, although M. Bayle asserts the contrary."

The same reproach of having attributed an excessive importance to the *délire ambitieux* in the diagnosis of general paralysis has been since repeated by all who have written on this disease; but, all at the same time allow that this derangement is of extraordinary frequency, and is to a certain extent its characteristic.

II. Among them, most prominent mention should be made of the works of M. Calmeil, for, if he was not the first to point out general paralysis, he was at least the first to furnish a complete description of it; and it may be with truth asserted that the book published by him, the same year as that of Bayle, has contributed more than any other work to diffuse an acquaintance with this disease.¹

The third chapter of this work (p. 323) is devoted to the aspect of mental alienation during the course of general pa-

¹ *De la Paralyse chez les Aliénés*, Paris, 1826.

ralysis, and it commences with an important declaration, in direct opposition to the views of Bayle: "It would be proof of an inaccurate sort of observation," says the author, "to wish to assign a constant form to the delirium of the paralytic insane, and to undertake to represent it in the same colors in all cases. In point of fact, it is certain that the aspect of the insanity may vary in different individuals, at different stages, and, what is more, from the commencement to the end of the same period. However," he adds, "among the symptoms of this disease there is one which, by reason of its (so to speak) constant existence, may be regarded as really characteristic, and which shows itself most frequently from the commencement—the enfeeblement of the intellectual faculties, that is to say—dementia." For M. Calmeil the exceptions are so rare that he does not think any importance should be attached to them. (Note to page 330.) Divers kinds of perversion are added to this intellectual enfeeblement, and here we find the *délire ambitieux* pointed out as the most frequent of all. "With a great number of insane paralytics, the enfeeblement of the intellect is found masked—if we may be allowed to express ourselves thus—by an exclusive derangement which is infinitely remarkable, and which deserves the more attention from having very frequently served as a diagnostic of general paralysis, several months before it appeared; they imagine themselves possessed of millions, of cities, etc." (p. 326). "But," adds M. Calmeil, "independently of the *délire des grandeurs*, many fixed ideas of a perfectly different nature may be met with;" and he describes several patients who were a prey to a melancholy or hypochondriacal delirium, though, owing to the rarity of these cases, the author, in the conclusion of this chapter, is enabled to affirm: "Lypemania is rare, and the greater part of the time the delirium runs on objects which flatter the imagination and plunge the individual into an imaginary joy of the keenest nature" (p. 332).

On the whole, M. Calmeil restricts himself to saying that in general paralysis the delirium does not present a constant form; that it is rarely of a sad nature, and in most cases consists of ideas of grandeur.

In another work by the same author, we find his ideas on the point with which we are occupied more fully expressed.

(*Dictionnaire en 30 vols.*, article "Monomania," t. xx., p. 139.) Treating of monomania, he takes that word in the sense Esquirol had at first wished to give it—that of partial gay delirium, in opposition to melancholy, or partial sad delirium. Thus he considers it synonymous with amenomania, and observes that this kind of insanity is almost always characterized by a sort of inflation of pride, of outbreaks of vanity. "Amenomania" he adds, "so often degenerates into paralytic insanity that some physicians have proceeded to the length of believing and affirming that the boasting insanity is necessarily the indication of a lesion of motility. I have often seen, for the last ten years, I see every day, monomaniacs, all of whose ideas and delirious conceptions are connected with illusions of the most exalted pride, without there being any cause to fear the development of general paralysis."

From these words, and other analogous passages in the same article, which we do not quote, wishing as we do to avoid tediousness, we may conclude that, in the opinion of the writer, the delirium or illusions of grandeur may exist in two very different conditions: on the one hand, in general paralysis; on the other, in partial delirium of a gay nature, without affections of motility—that is to say, in what he calls monomania or amenomania. This last idea was not put forth in the work on paralysis, but we had already met with it in the writings of Georget.

Among the characteristics assigned by M. Calmeil to the delirium of monomaniacs there are two which ought to be noticed. "It is wrongly imagined," he says, "that such patients always enjoy perfect happiness. The monarchs of mad-houses complain bitterly sometimes of the injustice and fear of their pretended subjects. Amenomania, therefore, admits to a certain point of a mixture of melancholy ideas." Farther on we find this other passage: "The delirium, as it has been repeatedly observed, is frequently but the exaggerated expression of ideas and sensations with which the mind is incessantly preoccupied; the insanity of pride is the lot of vain and ambitious subjects, who are always following the track of honors and distinctions." The author adds that the exceptions to this rule are altogether unusual. We shall see,

farther on, how frequently there is to be found a combination of ideas of grandeur and those of persecution in the same patient, and what an importance is to be attached, in certain forms of insanity, to the previous disposition of the subject; but we were desirous of noticing at once the indication of these important characteristics.

In the article "General Paralysis of the Insane," in the same Dictionary (t. xxiii.), the ideas professed are the same, but the terms employed to convey them are still more explicit. After having pointed out the frequency of the ambitious type of delirium in this disease, and indicated some of its manifestations, the writer adds: "We purposely lay great stress on these symptoms, because it has been asserted in some works that the delirium of pride constitutes a necessary symptom of diffuse encephalitis, and that paralysis necessarily attacks the deranged who are a prey to the *délire ambitieux*. Let us repeat here once more: incomplete general paralysis, with lesion of the intellect, commences daily with dementia, with an attack of lypemania, and yet the delirium, during the entire phlegmasia, may never take the turn of dwelling on ideas of grandeur and of wealth."

By comparing these different passages, we find, in the writings hitherto quoted of M. Calmeil, the complete refutation of Bayle's theory on the specificity of the ambitious type of delirium; since, in the opinion of the former, this form of mental aberration is not a constant symptom of general paralysis, and may be wanting, either at certain periods, or during the whole course of the disease; the latter may present, on the contrary, the characteristic of melancholy; in short, the delirium of grandeur may constitute a form of insanity entirely distinct from general paralysis. These ideas are precisely similar to those of Georget, only they are more developed.

Let us say at once, in anticipation, that, in his last work (*Les Maladies inflammatoires du Cerveau*, 1859), M. Calmeil reproduced the same views, with a single modification relating to the increased frequency of melancholy delirium in general paralysis. "For the last ten years," he observes, "this form of derangement has shown itself almost as frequently in

subjects attacked with a commencement of general paralysis, as has the derangement manifested by pride and boasting" (t. i, p. 276). Other writers, to whom we shall have to refer later, have laid equal stress, toward the same period, on the relatively considerable frequency of melancholic and hypochondriacal derangements in this disease.

Before proceeding further, we must mention Esquirol once more, with reference to his *Traité des Maladies mentales*, published in 1838, in which are to be found, side by side with the text of his original articles, contributed to the "Dictionary of Medical Science," certain additions closely related to the points on which new opinions had been broached since that epoch.

As far as monomania is concerned, Esquirol, at the same time that he defends this term which had already been attacked, expresses once more his wish not to employ any term the sense of which had not been previously clearly laid down; but, notwithstanding this, he relapses into his old contradiction, since, on the same page, only eight lines farther on, he employs the word monomania in the sense of partial delirium, of whatever nature it may be, and in the sense of delirium of an exclusively gay and expansive nature (t. xi., p. 2).

As regards the general paralysis which had taken so large a place in science, he persists in regarding it as a simple complication, as a new affection which is superadded to the insanity, and especially to dementia, with the effect of rendering it more serious, and thus he only speaks of it under the head of complicated dementia, which he asserts to be incurable (t. xi., p. 263). While fully admitting the frequency of ideas of grandeur in the disease, and bringing forward several cases in which they had most unmistakably manifested themselves, he refuses to acknowledge the pathognomonic importance which Bayle would attribute to them, and affirms that the monomania of pride exists without the paralysis, while, on the other hand, paralysis exists without delirium, and gives his entire adhesion to the opinions professed by M. Calmeil.

III. We are not undertaking here to give a complete historical account of general paralysis; otherwise we should be obliged to speak of a vast number of works devoted to that

disease from 1840 to 1850, and which bore more particularly on the relative epoch of the appearance of the delirium, and the muscular troubles, on the necessary existence or possible absence of the delirium, on the nature of the affection itself, etc.

As we are concerned with general paralysis only so far as the *délire des grandeurs* is connected with it, we shall pass over in silence the majority of these works, and only mention some passages from them which are really connected with our subject.

In the opinion of M. Parchappe, ideas of grandeur, of power, and of exaggeration, far from being characteristic of the delirium which accompanies the paralysis, manifest themselves, on the contrary, but once in four cases.¹

M. Brierre de Boismont almost admits the opinion of Bayle on the specific nature of the delirium, but with certain qualifications. "The complication of the paralysis with the alienation," he observes (*Gazette Médicale*, 1847, p. 781), "produces in the majority of cases an insanity which bears on the exaggeration of the ego, and not always, as Bayle has pretended, on the mania of wealth."

M. Trélat writes: "A great number of paralytics have no ideas of riches or greatness; there are some who, instead of being powerful, happy, and full of confidence, are timid, distrustful, agitated by lypemaniacal ideas" (*Annales Médico-psychologiques*, 1855).

M. Lasègue, in his important thesis on his examination for a fellowship, is not less reserved: "The characteristic delirium may be wanting, in spite of the intellectual disturbance."

M. Linas declares in a still more positive manner that "he could not raise his voice too energetically against the opinion which assigns to general paralysis a specific delirium."

We must dwell at greater length on an excellent description of the ambitious ideas of paralytics which we owe to M. Billod. This author shows that these ideas may affect different forms, and he arranges them into two groups. The first comprehends all patients affected with the delirium of a grandiose nature, described by Bayle and M. Calmeil, with whom

¹ *Traité de la Folie*, Paris, 1841, p. 210.

the elements of happiness are all drawn from the world of chimeras, produced out of whole cloth by the derangement, and proceeding essentially from just the opposite of the reality. The second group, on the contrary, is composed of paralytic patients who borrow from the real world all the elements of their happiness, but enjoy them otherwise than when in their state of health.

"The patient has doubtless, like the preceding ones, a tendency to boast in a peculiarly emphatic manner; but he boasts, on this occasion, of realities, the value of which is only enhanced in his eyes." (Some examples follow.) "Yet the affection is, in its progress, symptoms, end, and duration, identical with that of the delirious paralytics. These patients have not, it is true, delirious conceptions, but it cannot nevertheless be said that their mental state is a normal one. It is characterized by a predominance of ideas of happiness, but its elements are drawn at the source of realities. Another characteristic of this group is that the enjoyment, that the vanity, are out of all proportion with its subject." We will sum up the very interesting description given by M. Billod, by saying that the characteristic of this group is in general an optimism, which, though differing in degree from the delirium of *grandeurs* in its proper acceptation, approaches it very nearly when we consider the nature of the mental perversion, and should be considered as a weak or modified species belonging to the same genus. We, therefore, regard it as forming part of our subject.

Yet, according to M. Billod, all paralytic lunatics are far from being comprised, with reference to their mental state, in these two groups of the ambitious kind. He admits three other groups, the first of which is characterized by disorderly actions and affections of the will, without insanity of the intellect, properly so called; the second is marked by lypemaniacal ideas; and the third by the predominance of erotic inclinations, which, he says, are observed only in women. Without entering on the discussion which might arise from the admission of these three latter groups, we are content with remarking that it shows that M. Billod himself does not agree on certain points with M. Bayle, and is far from considering the ambitious variety of delirium as a constant in general paralysis.

IV. But was the question to be closed by the declaration made by Georget, M. Calmeil, and by so many others, that all persons insane with ideas of grandeur are not paralytics, and that there are monomaniacs with delirium of the ambitious type, entirely distinct from general paralysis? Was it not possible to go further, and to succeed in establishing between these two morbid forms a clinical distinction based on the different characteristics of the delirium of grandeur in each of them?

It is useless to insist on the importance of this problem, and on the advantage which must ensue, both to science and practice, from being able to establish with certainty the differential diagnosis between these two affections. In this direction some very earnest efforts have been made.

M. Baillarger, in his clinical lectures at the Salpêtrière (*Gazette des Hôpitaux de 9 et 16 Juillet; Annales Médico-psychologiques*, t. viii., p. 432), had already laid the first foundations of this distinction. "Ordinary monomaniacs," he observes, "differ from paralytic monomaniacs by their obstinacy in upholding their ideas. Having once advanced certain principles, they deduce from them very just and highly-logical consequences. Paralytic monomaniacs, on the contrary, owing to their loss of memory, have no connection in their ideas; they make gross blunders, and contradict themselves every moment."

M. Delasiauve had likewise said, when touching on the pseudo-mania of paralytics, that it was diffuse, incoherent, and without positive and continuous influence over the determinations of the will; while the true monomania is circumscribed and fixed, regulating more or less logically the conduct and actions (*Annales Médico-psychologiques*, 1844, p. 616).

But it is more especially in the important thesis of M. Jules Falret (*Recherches sur la Folie Paralytique et les Diverses Paralysies Générales*, Paris, 1853) that this question was treated in detail, and it may be said that, in science, the differential diagnosis of paralytic and non-paralytic ambitious delirium, in reality, dates from his work.

The second chapter (pp. 51 to 73) is entirely devoted to the study of the characteristics of the delirium in paralytic insanity,

and to comparing them with what is observed in other forms of mental alienation, and more especially in partial insanity (*délire partiel*), a term which the author prefers—and in our opinion with reason—to that of monomania. He shows at first, in a general manner, delirious conceptions in partial delirium, forming themselves progressively, after a long labor of incubation, during which the patient has slowly weighed and discussed them; then, once admitted, they manifest themselves in an invariable manner, they arrange themselves with a certain degree of logical precision, and at length are reduced to form, in a systematization, the foundations of which are no longer susceptible of modification, but which may admit of additions up to a much later period; at last, they reach an essentially chronic stage, when they become—so to say—stereotyped. With the paralytic, on the contrary, every thing is subservient to the action of the moment; every thing is diffuse and incoördinated; the delirious ideas more particularly are multiple, mobile, without motive, and contradictory.

These characteristics are applicable to the ideas of grandeur as to all the others, and allow of their being distinguished from the ideas of pride supervening accessorially or in a predominating manner in the other forms of mental diseases. Here follows an excellently-written description of the pride-affected monomaniac, and of the paralytic with ideas of grandeur, from which we would gladly borrow largely; but, we must restrict ourselves to the simple enunciation of points of doctrine, under pain of extending this article to an undue length.

V. Such was the state of the question when an interesting discussion on general paralysis arose in the Medico-Psychological Society, in relation to the thesis of M. Linas, which we have previously quoted.¹

On this occasion M. Baillarger brought forward an entirely new theory on derangements characterized by the predominance of ideas of grandeur. The author commenced by laying down as an established fact, in his opinion, that the really

¹ Recherches Clinique sur les Questions les plus Controversées de la Paralyse Générale. Thèse de Paris, 1858. For the discussion, see the *Annales Médico-psychologiques*, Années 1858 et 1859, *passim*.

characteristic form of general paralysis is the paralytic dementia; nevertheless, he then adds that, in the present state of the science, every maniacal state, with any symptoms of paralysis—and more especially with difficulty of utterance—or simply the ambitious form of delirium, even without difficulty of utterance, is considered as constituting the acute stage of a general paralysis which will hereafter become confirmed, and would be regarded, consequently, as entirely incurable. In other words, the mania of the ambitious type would always be the starting-point of paralytic dementia. M. Baillarger is inclined to acknowledge that this opinion answers to the majority of facts, but he cannot accept it as a general rule, and he deems himself able to bring forward in objection to it a notable series of observed cases borrowed from different writers, and from his own practice—cases presenting all the symptoms ordinarily attributed to general paralysis in its maniacal form, and yet followed by a cure which, if it has not always been a definitive one, has at least lasted for a certain number of years. He likewise quotes certain cases of insanity of a double form, which, during the period of excitement, presented all the characteristics of ambitious paralytic mania; and yet this stage disappeared entirely to give place to lypemania, and did not degenerate into paralytic dementia.

The ambitious variety of mania may further, in his opinion, present other terminations, which are not, however, paralytic dementia, and, consequently, the former should not be confounded with the latter.

It should be still less confounded with simple mania, from which it would differ by its greater gravity, by the mode of muscular excitation, by the special delirium, and, above all, by an anatomical condition which would constitute its principal characteristic, the sanguineous congestion of the encephalon.

Consequently, M. Baillarger proposes to constitute it a disease apart—under the name of congestive mania—which would be to paralytic dementia what simple mania is to dementia.

Such was the origin of the term congestive mania, which, having been introduced into science by M. Baillarger, has been employed, for the last ten years, by a certain number

of physicians, though it cannot be said, up to the present date, to have been definitively accepted nor to have had any positively uniform meaning attached to it.

From its first appearance it encountered vigorous opposition. MM. Parchappe, Delasiauve, Brierre de Boismont, and J. Falret, united their efforts to demonstrate that, under a great variety of commencement and form, all the cases ranged under the title of general paralysis present a certain number of constant characteristics, among others dementia and lesions of motion—characteristics which are sufficient to impress on this disease a stamp of unity which it is of importance to preserve. All agreed in rejecting the creation of a new morbid entity, which, in their opinion, instead of constituting a really independent disease, would be nothing else but paralytic insanity in its expansive form and acute beginning. As to the delirium of an ambitious kind, all united in repeating that it might be observed in other forms of insanity as well as the paralytic insanity, in mania and monomania for instance, but that, when it was combined with dementia and difficulty of utterance, it became the certain indication of a general paralysis.

As it is out of our power to give all the remarkable discourses to which this discussion gave birth, we shall content ourselves with borrowing some hints from that by M. J. Falret, in which the questions are found most clearly stated, and the answers most completely defined.

Directing his efforts especially to the defence of the morbid individuality of paralytic insanity, the speaker shows that the denial of its existence cannot be based either on the opinions of the earliest writers, who regarded it as a complication of former mental derangements, or on the existence of a certain number of cases in which it may not have been accompanied with delirium, or on the different varieties it may present on making its first appearance, or on the differences which are observed in the progress and symptoms of the disease.

Arriving at length at the question most directly in connection with the subject in dispute, that is to say, with the existence of maniacal attacks, accompanied with ideas of grandeur not terminating in general paralysis, he reminds his

hearers of the distinction which he had established in his thesis, between the different kinds of *délire des grandeurs* and the special characteristics of that which is peculiar to general paralysis: "But," he adds, "it is claimed that maniacs are to be met with who present these characteristics, who yet do not become necessarily paralytic. It will at least be granted to me that these facts are of rare occurrence; that in the immense majority of cases, if not in all, this special delirium is peculiar to the paralysis of the insane, and is followed by its later stages. It will likewise be granted to me that, in the majority of cases of supposed cure following on a state of this kind, the disease reappears ere long with all its essential symptoms, and that, consequently, it is but a continuation of the same disease after a momentary suspension. We are debating, therefore, only about certain exceptional facts on which we can be enlightened in a definitive manner only by further observation. For my own part, I think that a more advanced state of science will enable us to discover—even in difficult cases of this nature—means of diagnosis between the different varieties of delirium apparently identical, and that the peculiarity of the delirium of paralytics will emerge triumphant from this decisive ordeal."

These words have retained their full value, and we can justly say that the problem is stated in them in a manner which is, even at the present day, the most exact. Yes, in an immense majority of cases, the incoherent, diffuse, illogical, contradictory delirium of grandeur is united with symptoms of muscular disorder, which render the diagnosis of general paralysis definite from its very commencement, and the affection continues to develop itself subsequently in such a regular manner as to preclude all uncertainty in the judgment originally pronounced. But there also exist exceptional cases, more or less numerous, which we shall meet with, in our opinion, more frequently, just in proportion as our attention is fixed on these questions, and as our observation of the patients is made near to the original attack—cases in which certain anomalies in the symptoms, or the progress of the affection, will render the diagnosis a matter of difficulty, and make it necessary sometimes to suspend, for a certain time, all decision on this point.

Does the progress of science, the experience derived from previous observations, allow us in the present day—in conformity with the wish expressed by M. J. Falret—to set at rest these difficulties of diagnosis, and to reduce the uncertain and exceptional cases to a more and more limited number? Such is, properly speaking, the essentially practical side of the question proposed by the Academy, and such will be the principal object of the work we have the honor of submitting to its notice.

VI. But, before undertaking the study of this question on our own account, we ought still to mention some works relating to the nosological value of the *délire ambitieux*, which have been published since the great discussion of the Medico-Psychological Society on the subject of general paralysis.

We have already spoken, in our first chapter, of the word monomaniac. We have shown, on the one hand, the reason why Esquirol thought it necessary to invent this denomination; on the other, the want of precision and of consistency with which he may be justly reproached, in the definitions he has given of it, and in the use to which he has applied it. We could not, therefore, be astonished at the misunderstandings, confusion, and discussions, for which the introduction of this neologism was the signal. To enter into the details of these discussions would be to wander from our subject, but we are at least bound to mention them, since, by common consent of all writers, it is in monomania or partial delirium that the cases of ambitious delirium, foreign to general paralysis, are most generally encountered.

Certain medical men consider even that the exaggerated sentiment of personality plays so considerable a part in partial insanity, that they have proposed to replace the term monomania by that of *megalomania*. In a recent and justly-esteemed work, Dr. Dagonet has accepted both the theory and the denomination. The aim of this innovation has evidently been to remedy the inconveniences of the term monomania; but was the remedy in proper relation to the evil, and has it removed the latter? It has, if the term monomania was always taken in the sense of amenomania, in opposition to lypomania, as Esquirol would seem to have originally in-

tended ; it has not, if we remember that, for Esquirol himself, and for the general public, both professional and lay, monomania, on the contrary, embraces every variety of partial insanity, whether it be sad or joyous, whether it urge the patient to suicide, homicide, or arson, or whether it impresses only on the actions of the patient the stamp of morbid eccentricity. M. Dagonet himself falls into this same inconsistency ; for, after having employed throughout his article (*Traité Élémentaire et Pratique des Maladies Mentales*, Paris, 1862, pp. 370, 371) the two words monomania and megalomania as absolutely synonymous, he proceeds to describe, separately, religious monomania, an erotic monomania, and monomanias instinctive, drinking, homicidal, and suicidal, forms all of which—as their names alone suffice to show—are largely different from what he wished to designate under that of megalomania. He might have avoided this, if, instead of giving this term as purely synonymous with monomania, he had taken care to restrict it to the designation of a single species of the genus monomania, of that which, up to that time, had been habitually designated by the name of monomania of ambition, of pride, or of vanity, etc. We are aware that the confusion we have just pointed out does not exist in the mind of the author, but it is a matter of regret that it should not have been entirely avoided in the text of a work of merit, and of an essentially didactic and elementary character. Were this limitation once made, we think the term “megalomania” might be adopted with utility in the very precise sense of partial insanity, accompanied by a predominance of ideas of ambition, but without any symptom of general paralysis.

It is in this very limited acceptance that it has been employed by Dr. Broc, who took it as the subject of his inaugural thesis: *Observations et Reflexions Cliniques sur la Mégalomania*, Montpellier, 1863.” He defines it as “a monomania in which the predominant passion is an exaggerated sentiment of personality.” Without admitting that this sentiment is invariably owing to a passion, we are bound to mention this thesis in terms of praise, as it offers a happy combination of well-selected observations of cases, though we cannot but re-

gret that the differential diagnosis between megalomania and general paralysis does not receive in it the development it admitted of, more especially on account of the previous debates of which it had been the subject-matter.

Finally, M. Baillarger, who since 1865 has promised—as a complement to the *Traité des Maladies Mentales*, of Griesinger—an important work containing his definitive ideas on general paralysis,¹ has touched once more on insanity with a predominance of the ideas of grandeur, in a dissertation the publication of which was commenced in the *Annales Médico-psychologiques* in 1866, but which has unfortunately not been finished. After having reviewed the state of the question, and the differential characteristics indicated by M. J. Falret between the *délire ambitieux* of paralytics and that of monomaniacs, M. Baillarger protests against the importance of those characteristics, saying that, on the one hand, there are patients attacked with insanity of the ambitious type without either dementia or paralysis, whose derangement is not changeable, and approaches on the contrary to veritable monomania, and who, notwithstanding, after a longer or shorter period, end by falling into paralytic dementia; and that, on the other hand, it most frequently happens that the insane who have a changeable ambitious delirium, with signs of dementia, do not become paralytic.

But at the same time that he urges that the ambitious forms of insanity should not be confounded with general paralysis, he admits that they predispose to the latter in a great degree, and in this respect they are distinguished from simple insanity. This is a fact he has desired to signalize by the creation of a new class of insanity—that of congestive insanity. “Congestive insanities are not the first stage of general paralysis,” he observes, “but still less are they simple insanities.”

We see that, in spite of the difference of starting-point and of doctrine, M. Baillarger reaches, in substance, a conclusion which, in one point at least, differs but very slightly from that of M. J. Falret, namely, that if in the majority of cases

¹ The first number appeared in 1869, after we had sent our own work to the Academy. This prevented our profiting by it.

paralytic insanity may be recognized from its very outset, there are notwithstanding exceptional cases, which, in the actual state of science, present considerable difficulties in their diagnostics. Our readers are already aware that we intend later to undertake the study of these difficulties.

VII. To sum up, then, from the works examined in succession in this chapter, it appears that, since Bayle, no writer has treated of general paralysis without admitting the fact that the *délire des grandeurs* is extremely frequent among those affected by that malady; but, notwithstanding this, no one has unreservedly adopted Bayle's system.

Objections have been urged at one and the same time against the two essential points of that system: the constancy and the specific nature of the delirium of *grandeurs*. Georget, Calmeil, Esquirol, Parchappe, Brierre de Boismont, Trélat, Lasègue, Billod, and Linas, are agreed in affirming that general paralysis may exist without the ambitious form of delirium, and that ideas of grandeur may exist in partial insanity without general paralysis.

From the totality of these works it therefore results that the *délire des grandeurs* may predominate in two very distinct forms of *vesania*—partial insanity or monomania, and general paralysis.

It became thenceforth extremely interesting to seek—in the manifestations themselves of this delirium—for characteristics adapted to enable us to distinguish between the one and the other of its two varieties, and to allow of our founding on purely intellectual symptoms the differential diagnosis between the ambitious form of delirium in paralytics and in monomaniacs.

MM. Baillarger and Delasiauve, and especially J. Falret, directed their efforts to this end, and agreed that in partial insanity the ideas of grandeur are slowly elaborated, fixed, and systematized; while in general paralysis the ambitious conceptions are varied, changeable, not governed by any motives, and contradictory—bearing, in a word, the stamp of dementia.

M. Baillarger, however, after having contributed to the establishment of these distinctive characteristics, thought right

to admit, afterward, that they had not all the importance which he had at first attributed to them; especially he laid great stress on cases—according to him pretty frequent—in which the varied, and changeable, and incoherent ambitious delirium was able to exist without being accompanied or followed, at least immediately, by the other symptoms of general paralysis; thinking that these cases differ from cases of simple mania by the predominance of the congestive state of the brain, he proposed to make of them a special class of insanity under the name of congestive mania.

To this MM. Parchappe, Brierre de Boismont, Delasiauve, and Falret, objected that, almost all the cases cited by M. Baillarger, ending sooner or later in general paralysis, should be classed with the latter from the very commencement; and that, if sometimes this result arrived very late, such cases—which were very rare—ought to be regarded as exceptional, and very difficult to be pronounced upon *a priori* in the present state of science, but that this was very far from authorizing any one to erect them into a new class of insanity.

As M. Baillarger, however, persisted in his opinion, the question has up to this time remained unsolved; so that, at the present day, the problem relating to the semeiological value of the *délire des grandeurs* in mental alienation may be stated in the following terms:

1. All writers on the subject have agreed in saying that there are cases of partial insanity or monomania, essentially characterized by a fixed, coherent, and systematized delirium of a grandiose nature, entirely distinct, by that very fact, from that of general paralysis; several medical men have proposed to designate this form of insanity under the name of megalomania, which, it appears to us, should be adopted.

2. All writers on the subject are equally agreed in saying that in the greatest number of cases of general paralysis there is observed—at one stage or other of the affection—a grandiose delirium which is characterized by being changeable, incoherent, and contradictory, and which is thus to be distinguished from that of megalomania; reciprocally the mere existence of this kind of delirium ought to be considered as an almost certain indication of general paralysis.

3. There exists, nevertheless, a certain number of exceptional cases which appear not to respond to the preceding distinction, and in which, at least during a certain stage of the disease, the diagnostic feature is difficult or uncertain. M. Baillarger has proposed to collect in a separate group those of the above cases in which there is observed a stage of ambitious, changeable, and incoherent mania, followed by recovery, transient or durable, without persistent mental or muscular enfeeblement, and to make out of them a new class of insanity, under the name of congestive mania. This proposal has aroused serious objections, and, despite the efforts of its author, has not hitherto been generally admitted, so that the question still remains undetermined.¹

[*Adhuc sub judice lis est.*]

ART. III.—*A New Definition of Insanity.*² By THOMAS K. CRUSE, M. D., late House-Surgeon, Bellevue Hospital.

HE who would define insanity, faces obstacles such as make it hard to recognize that disease when its symptoms are few and doubtful. Mind being a metaphysical entity, possessing numberless departments metaphysically classified, the names of its disorders vary with the current classifications as readily, as the names are fitted to the conditions of patients with difficulty.

The reason of the difficulty is, because natural phenomena ever refuse to square themselves with our rules. Sometimes, to-day, puerperal insanity is a pitiable, most despairing, self-accusing melancholy, and to-morrow, a dangerously violent mania, hard to restrain from destroying life.

And yet we have no quarrel with these classifications of mania, melancholia, dementia, etc., etc. Since Pinel invented them, their good and respectable service has been, to express completely, and in a single word, the momentary

¹ *L'Étude Clinique de la Folie avec Prédominance de Délire des Grands*, to which this historical brochure stands as an introduction, is published in the *Mémoires de l'Académie de Médecine*, t. xxix., p. 310.

² Read before the New York Medical Journal Association.

states of the insane ; but, as a definition of the malady, in the sense that consumption of the lungs is a definition, they no more represent the one than hæmoptysis does the other. To satisfy such a requirement for insanity would necessitate clairvoyance that could foresee every state happening during the continuance of the disease.

The general definitions of insanity, such as the thoroughly logical exposition by Prof. Hammond, possess a defect which no one would admit more readily than that gentleman ; they deal in functions of the mind, not of the brain, which smacks wholly of metaphysics ; and since, in matters of speculation, thought is free, throughout the whole wealth of psychological literature no two authors think alike, because there is no unalterable bar at which opinions may be arraigned. If an attempt be made at compromise, as in Bain's book, it is in the shape of a sop thrown to scientists, of some talk about the medulla oblongata, while the rest of the book is wholly metaphysical.

In all these cases the will has played the arch-sophist ; theory grows, and facts come to water the same. Much of this sort of work, as the best of its kind, claims a discriminating homage, but, nevertheless, our complaint is of its nature, which is in the unfortunate plight to which Sir William Hamilton reduced consciousness : it can neither verify its objects, nor present them anywhere else for verification.

Hence it will be seen that we are not in a spirit of controversy. As a wit has it :

“ But first I would remark
That it is not a proper plan
For any scientific gent to
Whale his fellow-man ;
And if a member don't agree
With his peculiar whim,
To lay for that same member,
For to put a head on him.”

The comparison instituted above between phthisis and insanity contains the principle according to which insanity should be defined. Between talking of diseases of the brain and disorders of the mind, there is the distance between

things of such radically different complexion as the scientific and the metaphysical methods.

Suffer me to give a critic a peg on which to hang a joke, by asking the question, Do we realize the logical deduction from the absolutely-proved interdependence of brain and what we call mind? It was from such considerations as the increased amount of blood in the brain, the increased temperature of that viscus and increased quantity of the products of its destructive assimilation in the excretions during intense thought, and the reverse of all this during mental inaction; from such a well-worn lesson of anthropology as the size and quality of the brain, bearing a direct relation to its intellectual manifestations; from such a fact as the blood-relation between insanity and the other forms of human degeneracy, so insisted on by Dr. Maudsley in his recent address; from such observations as those of Mr. Tuke, on the intimate relation between mental emotions and bodily sensations, so that, as Mr. Tuke says, "It must constantly happen that in our terms, as in reality, we confound the two together, and, in this offending, fail to discover which is cause and which is effect;" it was from such considerations that Dr. Hammond was led to say, "The brain secretes mind." This shocked many people, but shocking is sometimes wholesome, as in paralysis and argument. We may gild the pill a little, and say, "There is no similarity, but only analogy, between the secretion of saliva and the production of thought;" nevertheless, the dictum is incontrovertible that, assuming the brain to have molecular action, activity of mind varies directly with the rapidity of that action.

Insanity has been divided and defined on three principles: that of Pinel, into melancholia, mania, dementia, and idiocy, based on the symptoms of disordered mental states; that of Bucknill, into disorders of the intellect, disorders of the sensibilities, and disorders of the will, based on the mental states themselves; and that of Morel, into hereditary, toxic, idiopathic insanity, insanity determined by neurosis, and dementia, based on bodily disorders.

The proposed definition proceeds on the third principle, thus:

Insanity is the psychic manifestation of brain-disease.

Take any brain-trouble—hyperæmia for instance, and its well-known scheme of symptoms. There are hallucinations of the special senses, evidenced by headache, hyperæsthesia of the surface, strange noises in the ears, kaleidoscopic views before the eyes; affections of motion, commencing in twitching of individual muscles, and going on it may be to epileptiform convulsions; lastly, disorders of the psychical functions to the extent of incoherence of thought, disturbance of the scant sleep by dreams, to which those of indigestion are visions of paradise, and maniacal delirium. Later, all details may be lost in coma.

It is not the purpose to examine the genesis of all this, much less further to particularize this or any other brain-disease; the sole intent is definitely to state what are psychical disturbances of the brain, and to say that of them is constituted insanity.

Using terms in their strictly technical sense, neither illusions nor hallucinations are psychical, but are disorders of the special senses, and the patient possessing them is not necessarily insane. But when these same illusions and hallucinations become delusions, that is, when the patient believes in their reality, his insanity is established; in other words, psychical disturbances have been added to those of special sense. A further remark—that delusions do not come in all cases through the senses—and we appreciate that psychical aberrations are not always dependent on either hallucination or illusions.

Lastly, let us say that psychical disturbance includes dementia, and excludes idiocy, the one being the fault of grave brain-degeneration, and the other of lack of development.

It is a natural corollary that, if insanity be a disease of the brain, the affected organ must exhibit etiological lesions. Let me catalogue the list of diseases found by Tuke and Rutherford, in their examinations of the brains of thirty insane persons: 1. Sclerosis (gray degeneration); 2. Miliary sclerosis; 3. Excavations of different extents; 4. Changes in the nerve-cells; 5. Changes in the nervous tubes and fibres; 6. Changes

in the vessels; 7. Granulations at surface of cerebrum, of medulla oblongata, of membranes of ventricles; 8. Amyloid bodies; 9. Changes in the neuroglia. This is evidence enough, still it is not to be maintained that, for every week's-old delusion, we are to expect any such palpable lesions. As before noted, hyperæmia causes much psychical disturbance, and yet what pathologist, in deciding its existence, would lean on such a broken reed as distention of the vessels on the convex cerebral surface? Still I think it tenable ground, that every attack of insanity, be it ever so passing and slight, has its tissue-lesion. There are functional diseases of the brain as of other organs; but, just as we call palpitation or neuralgia functional, only because we have not detected the minute hæmoral or nervous lesion on which they depend, so do I believe of the brain, that the alteration is there, and some day may be detected.

So rational to me seems this method, that its ordinary bounds deserve enlargement, and can readily so be altered. Thus, what more natural than to regard the insanity of the pubescent girl, parturient woman, hard drinker, syphilitic or rheumatic subject, as dependent on poisoned blood circulating in the brain. The blood-changes in fever have long been invoked to explain the intercurrent delirium, and in a truly philosophical division fever-delirium is insanity. Lastly, the thin blood of the anæmic, and most insane are anæmic, causes degeneration of the brain as surely, and probably in the same way, as a tumor in its substance, both diseases causing anæmia of the capillaries. .

In conclusion, a few words on a natural system of classification, suggested by the definition :

It is generally conceded that the venerable classifications serve but to confuse when in the actual presence of the insane. Their advantages have been indicated; they enable us to state, in a court of law, that at one time the patient was a maniac, and at another demented—to express conditions clearly and definitely. Apart from this, any satisfaction to be drawn from the diagnosis, as such, is problematical. To say a man is demented, is to say, when the term is translated into the vernacular, that he has lost his wits. We have no specific

for dementia, and as a guide to the long train of pathological processes by which the brain has reached its present wreck, as a foundation for a single therapeutical indication, the term is worse than useless.

Is it not our practice reverently to read such nonsense in books, and when called to a patient to unlearn it all; to search diligently for the cause of the disease, with ophthalmoscope and thermometer to discover the present condition, and then prescribe?

If this is not our way, what is the philosophy of our association of one form of insanity with the puerperal state, of another with the consequences of alcoholism, and of another with syphilis?

One reason is, that the association is well marked in these instances, and we are not disposed to relinquish any thing so positive.

There is no reason why this method of Skae should not be developed to yield many equally valuable associations.

We might name this the causal classification of insanity. It is evidently the most natural, and fruitful of help to therapeutics.

NOTE.—While Dr. Cruse has given a definition of insanity which is in the right direction, and has written very philosophically in support of his views, the terms of the definition are not sufficiently explicit. A man insensible from the effects of cerebral hæmorrhage exhibits “psychic manifestations of brain-disease,” and yet he is certainly not insane. The definition of the editor, “a manifestation of disease of the brain, characterized by a general or partial derangement of one or more faculties of the mind, and in which, while consciousness is not abolished, mental freedom is weakened, perverted, or destroyed” (“A Treatise on Diseases of the Nervous System,” p. 834), appears to be preferable. If Dr. Cruse’s definition were made to read, *a psychic manifestation of brain-disease unattended by loss of consciousness*, it would probably be more compact, and fully as logical as any extant.—EDITOR.

ART. IV.—*On the Pathogeny of the Infarctions or Congested Patches which follow Embolism.* By JOHN J. MASON, M. D., one of the Attending Physicians to the New York State Hospital for Diseases of the Nervous System, and to the Out-door Department of Bellevue Hospital.

IN the autumn of 1869 I read the interesting work of MM. Prevost and Cotard,¹ and was much impressed with the following sentence with which the authors conclude the first part of their memoir :

“Nous avons rapporté ces faits qui nous paraissent intéressants mais il nous semble impossible d'en donner une explication rationnelle dans l'état actuel de la science.”

The question, the solution of which presented so much difficulty, was this, viz. : How to account for the congestive tumefaction which so often and so rapidly occurs in the parts supplied by an artery occluded by an embolus.

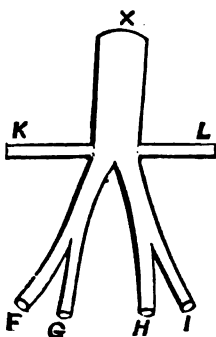
A few weeks later an explanation suddenly occurred to me, which I wrote down upon the margin of a book I was then reading. As two years' experience has only strengthened the opinion then recorded, I feel justified in presenting it to the consideration of pathologists, who I trust will see in it a suggestion of some value, should they fail to accept it as a sound theory.

And first let us examine carefully the theories which have already been advanced.

The observers above quoted experimented with the apparatus represented by the cut. The largest of the caoutchouc tubes X being fixed to an ordinary faucet, a current of water was first allowed to flow freely from all the others. L and H, K and G were then closed by two U-shaped manometers. When, now, I was closed, F being open, the mercury indicated an increase of tension at H, which increase was greater

¹ Étude Physiologique et Pathologique sur le Ramollissement Cérébral, 1866, p. 43. See also Proust, Des Différentes Formes de Ramollissement du Cerveau, 1866, pp. 40-43; and Bouchard, De la Pathogénie des Hémorrhagies, 1869, pp. 110-114.

than at G. When F was closed, I being open, the increase of pressure was greater at G than at H.



This accounted very well for the congestion, when limited to the collateral vessels, but why should more blood pass into the distal portions of the occluded branch than passed before the occlusion?

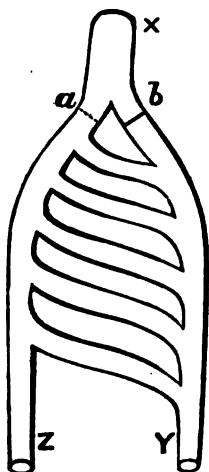
To explain this puzzle, a theory¹ has been advanced, and accepted as conclusive by some lecturers in Germany. This one is based upon the principle of the lateral pressure which a column of liquid exerts. It claims that, when the plug arrives, this lateral pressure upon the outlets of the anastomosing branches is taken off, and that this cause, together with the increase in the collateral tension, invites an excess of arterial blood.

This increase of tension in the collateral branches and the diminution in the lateral pressure may go far toward maintaining an amount of circulation necessary for nutrition (which, by-the-way, it does not always accomplish), but both these elements taken together cannot increase the actual amount of blood in the parts supplied by the occluded branch.

By giving to a series of caoutchouc tubes such an arrangement that two branches shall be connected by numerous others, we can study experimentally the value of the above explanation. I have made a number of experiments with an apparatus of the kind, constructed especially for the purpose,

¹ Alluded to in Virchow's *Abhandlungen zur Wissenschaft. Medicin*, pp. 455, 456, and the fallacy of the theory briefly shown.

and am satisfied that, when the lateral pressure is taken off by the occlusion of any one branch, the effect is merely to relieve the increased collateral tension, and that less liquid always flows from the terminal orifice than flowed before the occlusion.



X is fixed to a Croton-water faucet, and the time required to fill the vessel measured by a metronome. When *b* was closed, the vessel was filled from Y in 284 beats of the metronome. When *b* was open, it was filled in 270 beats. This was the result of about thirty observations made at different times. The oblique direction given to the connecting tubes of course favored the flow from Y.

Careful observation was made of the force of the currents of water flowing through the apparatus under different conditions, as well as the different periods of time required to fill a vessel of known capacity. The missing link in the chain was I think first brought to light by M. Brown-Séquard,¹ in his experiments on the effects produced by the ligation of the renal and splenic arteries.

Paralysis of the vaso-motor nerves is produced by the ligation, followed by a dilatation of the arterioles sufficient to induce a reflux of blood from the venules.

Dr. Allbutt,² in his new and most valuable work, suggests an explanation, based upon the experiments just referred to

¹ Also, lately, *Archives de Physiologie Normal et Pathologique*, 1870, pp. 518, 519.

² On the Use of the Ophthalmoscope in Diseases of the Nervous System and of the Kidneys, pp. 287, 288.

and a case of retinal embolism treated and reported by Dr. Knapp, of this city. It is expressed substantially in the following paragraph, which I quote verbatim:

"Now, if embolism has any thing like the same effect which ligature has upon the distal branches of an artery, we have at hand a very interesting explanation of certain well-known and hitherto-puzzling phenomena of these cases, such, for example, as the congestion more or less venous of the parts beyond the plug, and the strong tendency to hæmorrhage. . . . A plug inside an artery is not of course so efficient a paralyzer of its associated vasal nerves as a ligature would be, but the distensile force, stretching the arterial coat behind an obstruction suddenly formed, is likely, as it seems to me, to have a similar if not a coextensive effect."

The anatomical arrangement of the vaso-motor nerves is longitudinal rather than circular; hence I think they would hardly be stretched by a moderate degree of dilatation behind the plug. A squeezing of these nerves might occur, where the artery was closely surrounded at the point of occlusion by tissues of bony or cartilaginous consistency.

Moreover, according to Virchow,¹ the artery always contracts upon the embolus. Now it seems to me that such a contraction would be at most but very transitory, were the nerves paralyzed by a cause acting behind the obstruction. I believe with Dr. Allbutt that the arterioles dilate beyond the plug; but, in order to explain the cause of this dilatation, I have an element to suggest, which, I feel sure, has not been considered sufficiently, if at all, hitherto.

Since the muscular fibres which surround the arterioles, as well as arteries of much larger size, are, in the normal state, capable of relaxation, we must suppose them to be maintained in a condition of tonicity throughout life. We know that these fibres are under the control of influences transmitted through the vaso-motor system of nerves. Now, why deny to this system of muscular fibre and nerve the property of responding to reflex stimulus, when we give it to all other systems of muscles and nerves?

¹ *Gesammelte Abhandlungen zur Wissenschaftlichen Medicin*, Note 16, p. 727. See also p. 219, *et seq.*

Nearly all physiologists¹ agree in ascribing to the regular filling of the heart's cavities, an important part in the causation of its rhythmical contractions.

Experiments of Haller and many others have shown that stimuli applied to the interior of the heart, and especially injected liquids, are very active means of producing contractions of this organ. The circulation in the smallest arterioles of a frog's web receives an impulse, visible by the aid of the microscope, at each systole of the heart. As further arguments from analogy, the well-known action of the iris, uterus, œsophagus, stomach, and intestines, may be cited. In view of all these considerations, I see no absurdity in assuming that each segment of an arteriole is in part stimulated to contraction by each cardiac impulse which it receives, and is in part thereby maintained in a state of tonicity. An embolus suddenly arrives in an arterial branch; the artery contracts around it; the system of muscle and nerve beyond the plug no longer receives its accustomed stimulus, and a dilatation of these parts ensues, inviting a gradual and steady flow of blood from the surrounding vessels.

In those cases where the anastomosing branches are sufficiently numerous to supply all the branches of the occluded vessel, with their accustomed stimulus, no dilatation or infarctus takes place.

In those cases, however, where the collateral supply is tardily furnished, the "sentinels at the gates of the capillary system" are no longer warned to perform their duty; the arterioles dilate, and blood from the veins and from the main arterial trunk is pressed in, forming, sooner or later, a congested patch, a veritable stasis.² Were a dilatation of the whole arterial system to take place, the distal ends would become congested at the expense of the main trunks, because of the greater combined calibre of the former. This may

¹ Flint's "Physiology of Man," vol. i., Circulation.

² The filling of the vessels occurs so gradually that they receive no normal stimulus of distention, and perhaps very soon lose their contractile power through lack of nutrition. This loss of power, through lack of nutrition, ought, as it seems to me, to be considered as a secondary and *not primary* result of embolism, as has been suggested.

account, in a measure, for the fact that, in embolism of the central retinal artery, the branches which are beyond the embolus, and which are large enough to be seen by the ophthalmoscope, appear to be emptied of blood.¹

It now remains to review briefly, in the absence of direct experimental proof, the evidence in support of the hypothesis upon which this theory mainly relies.

Reasons have been given why all other explanations of this morbid phenomenon are insufficient. These need not be repeated:

a. The pulsations communicated from the heart and arteries are plainly visible in the blood-current within the smallest arterioles.

b. Liquids, suddenly injected, are very efficient in exciting cardiac and uterine contractions.

c. When we irritate the vessels in a frog's web, they respond so forcibly to the stimulus, that their muscular coats are paralyzed, as is now generally admitted, by the force alone of the contraction.

d. The property of responding to the stimulus of distention has been given to all other similar systems of muscle and nerve.

e. It renders more intelligible the function of the arterioles as regulators of supply, to suppose that the nerve-centres receive with each new impulse of the blood-current an indication, as it were, of the amount of nerve-force needed, than does the supposition that these centres originate and regulate this force unaided.

Finally, taking also into consideration what we know to-day of the restraining action of certain brain-ganglia over reflex movements, may we not have at hand a clearer knowledge of the *modus operandi* of healthy sleep, and the basis for a clearer philosophy of the increase of function of certain glands which follows irritation of neighboring sensitive nerves?

¹ *Vide* Case of Dr. Knapp. Archives of Ophthalmology and Otology, vol. i., No. 1, pp. 64-84.

ART. V.—*A Case of Diffused Cerebral Sclerosis.* By HENRY R. BALDWIN, M. D., of New Brunswick, N. J.

SCLEROSIS is not so rare a malady as to require notice simply on that account. It is not, however, in every case that the conjectures of the physician can be tested by autopsic disclosures. In this relation it seems that nothing should be deemed unimportant, if, by record, the aggregate of medical facts is increased. The victim of the disease, the name of which heads this history, was a gentleman of rare endowments and extensive acquirements; his ancestry were healthy, his habits unexceptionable; he was the father of nine children, all of whom are living and healthy. Some two years since he was assailed by charges highly derogatory to professional and personal character. The charges proved unfounded; but, to escape the mental torture of a sensitive nature, severe and protracted literary labor was undertaken. It was not, however, until the early part of the year 1871 that evidence of intracranial disease was apparent. About this time the patient complained of a loss of memory, which had always been remarkably retentive. He constantly miscalled the names of persons who were familiarly known to him. He next miscalled things; a watch would be called a star, etc. He was quite conscious of this failing, and was much annoyed thereby, saying, "I will get it in a minute; you know what I mean," etc. He could articulate complex words with great distinctness, showing the integrity of the muscles concerned in articulation as well as the larynx. Distinct chilly sensations marked the early part of the disease. He complained of pain on the left side of the head, which was characterized as intolerable. This pain seemed intermittent, exacerbations occurring during the afternoon and evening. The tongue was not deflected to either side. The pupils were only slightly affected, the left being somewhat contracted. Facial palsy of the right side was first shown by a deficiency of the furrow extending from the nostril to the angle of the mouth, and at the same time an apparent excessive contraction of the muscles of the left side of the face. He could still walk well, and had considerable power of both hands. He was, however, obliged to give up his literary

labors. Slight bewilderment was now occasionally noticed, or perhaps it is better expressed by an uncertainty as to what to do next or where to go; coincident with this there was shuffling, which was not *always* present. Recognition of friends, joy, and the emotions generally well preserved. Unilateral sweating was present in a marked degree, the seat of pain being free from moisture, while the right side of the head was covered with perspiration. The hands now became weaker, and complaint was made that the right leg seemed shorter than the left. Examination of the urine revealed no albumen, but granular casts were present under the microscope. There were no epileptic seizures at any time, nor was there present any noticeable flexure of the fingers; tremors of the muscles were not present. The pulse was slightly accelerated, uniformly about 92 per minute. There was no noticeable disturbance of respiration. The appetite was capricious, and at times relaxation, and again some tardiness of the action of the bowels; during the last month of life there was a gradual failure of the mental powers, and an increase of paralysis of the right side. The conjectural diagnosis during life was lesion of the left hemisphere in the neighborhood of the deep origin of the facial nerve, the nature of lesion not determined. During the month of July the patient visited Dr. W. A. Hammond, who, from ophthalmoscopic and other examination, confirmed the above opinion, proving, through the agency of the dynamometer, considerable loss of power of the right hand.

The treatment consisted of bromide of potassium to relieve pain; the occasional administration of a mild tonic, to keep up the tone of digestion; a laxative or astringent, if necessary; and nutritious alimentation. It was found that the central pain was more relieved by half a grain of digitalis (English leaves), every three hours, than by any other agent.

The autopsic examination was made forty-eight hours after death. The head only was examined. The cranium was found below rather than above the ordinary thickness. The dura mater was unusually adherent to the calvarium, so much so, indeed, as to require great force for removal of the skull-cap. Marked osseous deposit existed at several points in the course of

the longitudinal sinus. No signs of lymph were present upon the arachnoid. The cavity of the arachnoid contained no unusual quantity of fluid. The vessels of the pia mater were fuller than natural. The whole substance of the brain was of unusual hardness. Upon slicing the substance of the brain, the layers could be easily handled without danger of disintegration. The lateral ventricles contained a small quantity of serum. Upon deeper slicing (on the left side at the transverse fissure, and occupying the position of the corpus fimbriatum, and a part of the hippocampus major) was exposed a round mass of a lemon-yellow color, of the size of a hazel-nut, and which looked like a mass of adipose substance. The choroid plexus, as it passed through the transverse fissure, was found completely disintegrated; descending from the mass above mentioned, the substance of the left hemisphere of the cerebrum was found for the space of a square inch to be almost diffuent. Microscopic examination of the yellow mass above described showed an abundance of oil-globules, but no traces of proper brain-tissue. The same was true of the deeper-seated structural lesion, which was of a dirty-gray color, with quite a distinct line of demarcation.

CONTEMPORARY LITERATURE.

REVIEWS.

French Archæology.

THIS splendid work,¹ which simply claims to be a collection of various contributions to the archæology and paleontology of a limited portion of Southern France, is so exhausting in its character, and so important in its bearing upon numerous questions of the highest scientific interest, that it must rank as the most valuable addition hitherto made to the literature of the sciences to which it refers. The *Reliquiæ Aquitanicæ* owe their origin to the long-continued and unremitting labors of the late lamented Mr. Henry Christy, of London, who, with

¹ *Reliquiæ Aquitanicæ*; being contributions to "The Archæology and Palæontology of Périgord and the Adjoining Provinces of Southern France." By Edouard Lartet and Henry Christy. Parts I.-X., 1866-1870. London: Williams & Norgate.

the coöperation of his friend M. E. Lartet, presented a series of important researches in the valley of the Dordogne, which have now become land-marks for all future investigators in the domains of archæology and paleontology. At the very moment that the results of these investigations were about to be published, and the first few sheets of the present work were already in the hands of the printer, the death of Mr. Christy, through an attack of acute illness, brought on by over-exertion in a visit to the bone-caves of Belgium, appeared to threaten the completion of the publication, and the general regret felt at the loss of this zealous and able investigator was heightened by the fear that his invaluable labors might be lost to the world. This, however, happily proved to be an unfounded cause of apprehension; for, to the extreme satisfaction of all interested in the progress of paleontological inquiry, it was soon known that ample provision had been made by Mr. Christy for the prosecution and completion of the work. He had, in fact, arranged the style, plan, and mode of its publication, and these have all been faithfully carried out, first by M. E. Lartet, and, since the recent lamented death of this distinguished paleontologist, by Prof. T. Rupert Jones, of the Royal Military College, Sandhurst, the English editor of the work.

Before we proceed to consider the subjects treated of in this splendid publication, we ought to explain in reference to the Latinized title appended to it, which involuntarily calls up associations with the early mingled histories of England and France, that it was selected by Messrs. Christy and Lartet on the ground of its applicability to all the stations at which their explorations were made. The geographical term "Aquitania," which has had different limits at different periods, comprised originally only the lands lying between the Pyrenees, the Garonne, and the Atlantic; but, after the decisive Gallic victories of the Romans under the Emperor Augustus, the province was considerably enlarged, and then subdivided into *Aquitania Prima*, *Aquitania Secunda*, and *Aquitania Tertia*. When in later ages France became an independent state, and was divided into provinces, the *Aquitania Secunda* of the Romans was subdivided into those of Angoumois, Bordelais, Medoc, Agenais, Poitou, Saintonge, and Périgord; and it is in the last named of these Aquitanian provinces that all the osseous and other remains were found that form the subject of the present work, the explorations of Messrs. Christy and Lartet having been carried on—as were also those of M. Louis Lartet at Cro-Magnon—in that part of Périgord which forms the present Arrondissement of Sarlat, in the Département of Dordogne.

The scene of these explorations must be familiar to all who have traversed the rich plains of France from Paris to Agen or Toulouse by the central line, passing by Orleans, Chateauroux, Limoges, and Périgueux; and few travellers can fail to have been struck by the sudden change in the physical aspect of the country that meets their eyes on descending into the valley of the Vézère, about twenty miles south of Périgueux. Here the two sides of the valley rise in great escarpments of massive rock, more or less interrupted by ancient falls, and crowned with projecting summits, below which may be traced at the same level on either side of the valley extensive horizontal flutings or grooved niches. As these hollows are at many points continued into the rocks bordering the lateral valleys, down which small streams run into the Vézère, the first impression suggested is that they have been produced by the rapid movement and continuous passage of water, which may in some earlier and remote period have filled up these valleys. A more careful examination of the phenomenon shows, however, that atmospheric agents have probably had more to do with the hollowing of the exposed surfaces of the rock than mere erosion, as the alternating lines of projection and recession will be found to correspond with the various degrees of hardness or softness of the different strata. This view is corroborated by observing the rocks after a thaw, or even sometimes in summer, when intense heat has followed moist and rainy weather, for under those conditions large thin plates, and small films or flakes of the rock, scale off along the line of the hollow flutings, while at the foot of the escarpment accumulated masses of this *débris* are to be seen undergoing a reconstructing process of solidification through the action of the percolating water which infiltrates them with the calcareous matters held in solution in it.

It is in these cavities or hollows that the osseous and other remains have been found which are described in this work, and there are five stations at which the Christy and Lartet explorations were specially made, viz., Les Eyzies, Langerie Haute, Langerie Basse, La Madelaine, and the cave of Moustier, all situated within the arrondissement of Sarlat. These stations, as we shall presently show, have not as yet yielded any human remains, although they are rich in evidences of the industry of the early men of the Dordogne, and it was not till the year 1868 that the discovery of several human skeletons, buried beneath the thick calcareous strata of the valley of the Vézère, afforded the last and crowning proof—if any had been needed—of man's presence in Southern France contemporaneously with a long extinct fauna. These invaluable remains, which were discovered in the cave of Cro-

Magnon, near the older station of Les Eyzies, are of such extreme importance to paleontology generally, that we shall have to consider them apart from the other deposits of the Dordogne caves; but, leaving their consideration for the present, and following the order of precedence of the discoveries themselves, we will begin with the five older stations. Of these five foci of exploration, it may be generally stated that although they do not present a uniformity in the products of human industry contained in their deposits, they yet must all be considered as belonging chronologically to the "age of simply-worked stone, without the accompaniment of domestic animals." Only three stations, viz., Langerie Basse, Les Eyzies, and La Madelaine, have as yet yielded carvings of the figures of animals on stone, bone, or reindeer-horn; in the two latter localities, worked ivory has been met with, in the first named a portion of the pelvis of an elephant was found, and, from all the five principal stations, separate plates of the molar teeth of *Elephas primigenius* have been obtained, but their occurrence is explained on the supposition that such teeth might have been intentionally introduced. As paleontological peculiarities, special to a single locality, we may instance two molars of the great Irish deer (*Cervus euryceros*, vel *Megaceros Hibernicus*), and the phalanges of a great bear marked with notches made by a cutting instrument, the former found at Langerie Haute, and the latter at Langerie Basse; the Moustier Cave has yielded part of the lower jaw of *Hyæna*, and Les Eyzies the metacarpal of a large *Felis* (probably *Felis spelæa*), which exhibits marks of scrapings, such as are often seen on the bones of the herbivores eaten by the natives. The only specimen of gnawed bones as yet discovered belongs to one of the caves of La Madelaine, where the head of the femur of a horse has been found, which bears slight traces of the sharp teeth of a young carnivore. These facts appear to indicate that the people who occupied these caverns must have had the means of closing them against beasts of prey, whose existence at that time in the country has been proved with certainty. The almost complete absence of the backbones of the ox and horse, while those of animals of less size, especially the reindeer, are found in large quantities at all the stations, strikes one at first sight as a remarkable circumstance; but this is explained by Messrs. Lartet and Christy on the assumption that the larger animals may have been cut up by the aboriginal huntsmen on the spot where they were slaughtered, and the less weighty extremities only carried away. The heads of the animals seem to have been always brought to the cavern-abodes of the primitive men, probably for the sake of the brain, for great accumulations of the fragments of the cranial bones are met with at all the stations.

Two important points in reference to the chronology of these deposits are, first, that not a single bone, referable to a *domestic animal*, has been found at any station yet explored, while, on the other hand, remains of the reindeer are abundant; and, secondly, that among the countless masses of worked flints of the most varied types, which have been examined, not one has exhibited traces of intentional polish. These facts suffice to distinguish definitely this *First Period* of the Age of Stone from the *Second Period*, when polished stones are present in considerable numbers, together with the remains of domestic animals; and we have evidences of the existence of habits of agricultural industry, entirely unknown to the earlier inhabitants. These contrasts involve the supposition that a great lapse of time must separate these two periods, for, although we might explain a sudden advance in civilization by the assumption of invasion by a superior race, and a consequent extermination of the conquered people, such an hypothesis will not account for the rapid disappearance of a species of animal so useful to man as the reindeer; yet, it must be remembered that not a trace of this animal is to be found either in the Kjekkenmøddings of Denmark, though so much nearer the sub-arctic regions, in the oldest of the Swiss Lacustrine dwellings, or in the most ancient of the dolmen, cromlechs, or other sepulchres.

The explorations of the valley of the Dordogne, which conclusively prove the important fact of man's coexistence with the reindeer in latitudes so much lower than the present limits of that animal, are additionally interesting from the evidence which they afford of the comparatively civilized condition of the natives of Southern France in that age; since we find that, besides serving for food, and supplying articles of clothing and implements of utility, the reindeer was made subservient to purposes of art, and requirements of artistic ornamentation, which are incompatible with the *lowest* stages of savage life. Thus, we meet not unfrequently with broken or entire reindeer-horns, with representations of the animal itself carved or graven upon their surfaces with a fidelity and freedom of touch that strike us with astonishment. In the face of these facts, however, the question of the antiquity and duration of the Reindeer Age in Southern Europe continues to perplex paleontologists. Mr. Christy was of opinion that, geologically, a wide gulf separates it from the Drift-Valley-Gravels-Period, where the mammoth, rhinoceros, horse, and ox predominate, and the reindeer occurs only sparingly; the reverse being found to prevail in the Dordogne Caves, where all traces of such domesticated

animals as the sheep, goat, and the dog, are wanting. Mr. Prestwich has found the remains of reindeer associated with worked flints in the quaternary beds of the drift at Bedford (England), and also at Abbeville, and at Clichy, near Paris, and, more recently, remains of this animal were found by Mr. Christy himself in the valley gravels of St. Acheul, and by M. E. Lartet in the drift of the Oise (France); while the late Dr. Falconer noticed bones of this animal in the Gower Caves of South Wales, together with numerous remains of *Elephas antiquus* and *Rhinoceros hemitæchus*. The deposits of the Dordogne Caves consist, in addition to the usual accumulations of broken bones, of various-sized pebbles of stone, differing from the local rocks, and collected from the river-bed; nodules of flint, from which flakes have been struck; innumerable chips having apparently been detached in the processes of working; and countless thousands of blades of flint, varying in size from lance-heads, long and stout enough to have been used against the largest animals, down to lancets no bigger than the blade of a penknife and piercing-instruments, as slender as the smallest bodkin. These remains, which are usually intermixed with charcoal-dust, and broken into small fragments, extend, in some cases, to a depth of eight or ten feet, and a length of sixty to seventy feet. Besides these have been found a multitude of implements formed of bone or deer-horn, evidently made on the spot, as is proved by the presence of the remnants of the bones and horns from which they have been sawed, and the unfinished state of many of the implements themselves. These are of various kinds, square and chisel-shaped, round, sharp-pointed, awl-like, etc.; there are plain and barbed harpoon-shaped arrow-heads, bone needles of all sizes, some of which are so sharply-pointed and finely polished, and having such small and regularly-drilled round eyes, that the observer might well doubt whether they could have been fashioned with a stone tool; but this question has been set at rest by the employment of some of the implements found *in situ* to produce similar needles. Nearly all the deposits as yet examined have yielded specimens of ornamented work, and in three of them recognizable representations of various animals have, as already mentioned, been found drawn or sculptured on bone.

The broad features of the fauna are the same throughout the entire Dordogne district, and it may be generally asserted that the reindeer is almost everywhere the most prevalent animal; the horse next in order in some places, and the aurochs in others—the first two having, as is already testified by the appearances of the bone-remains served as a staple food. The ibex and the chamois, which

are now only met with on the higher peaks of the Alps and Pyrenees, were natives of the district. The wild-boar was either scarce, or but little eaten; but birds and fishes, including large quantities of salmon, must have been abundant, and the articulated state of many of the animal bones indicates that, in regard to quantity of food, there could not have been any great scarcity, such as to induce a struggle for existence.

These evidences in favor of easy living render it less difficult to understand how spare time could be found for the rude attempts at ornamentation which have been left to us by the early cave-dwellers. It is to be regretted that several of the representations of the reindeer are in an unfinished state, but, even in that imperfect condition, these attempts exhibit considerable cleverness in the adaptation of the materials to the purposes intended, as in a poniard-handle representing the figure of a reindeer. The art of painting was, as far as we know, limited to the use of red, and various pieces of soft red hematite, covered with scratches, indicate how the surface was scraped to form a powder; and this, mixed with grease, would, no doubt, furnish as good a pigment as any employed by savages at the present day. Drilled and ornamentally-cut shells, and teeth of animals, have been found in many places, and were, no doubt, used as ornaments or charms, while the presence of whistles, made of the phalangeal bones of the reindeer and chamois, show that sound as well as sight was sought to be gratified by these primitive men. Their migratory habits, or, at all events, their means of communication with the outer world, are proved by the discovery among the usual deposits of wrought and unwrought rock-crystal, and of several fossil shells, which must have been brought at least a distance of one hundred miles—the nearest locality of the shells being the Faluns of Touraine. These specimens have all been drilled as if for purposes of suspension. The domestic economy of these early races is revealed to us in their hearths and boiling-stones, and in the fractured, hammer-like stones, which would seem to have been used for the extraction of the marrow from the bones; and as a very small proportion only of the bones show evidence of the action of fire, we may, perhaps, be justified in assuming, with reference to their mode of cooking, that the food was not cooked by roasting. The absence of sufficient depth of earth between the layers of bones and the rock-floor, at spots where the charcoal and burnt pebbles are in the greatest abundance, also forbids the idea that these cave-dwellers cooked in the manner long practised by some North-American tribes, and still noticed among the gypsies of Europe,

namely, by enclosing the animal in an envelope of clay, burying it in a deep hole in the ground, and lighting a fire over it. We may, perhaps, assume that the food was boiled by means of heated stones thrown into vessels of wood, bark, or matting, filled with water, as is still noticed among some tribes in Alaska and elsewhere. Numerous water-rounded granite pebbles, with artificially hollowed-out upper surfaces, with depressions from one to five inches in diameter, have been found upon the hearths of the caves, the uses of which are unknown, although they may possibly have served for platters or other receptacles for food; at any rate, there is an almost total absence of pottery in these deposits of the Reindeer Period, although, in later periods of the Stone Age, the inhabitants of that part of France were acquainted with it, for at the distance of a few miles from the Dordogne district abundant fragments of pottery have been lately found associated with a chipped barbed arrow-head of the so-called Celtic type, and a portion of a polished stone axe.

Having thus very briefly indicated the nature of the objects revealed by the modern explorations of the ancient homes of early man in Southern France, it will be well to take a hasty glance at the probable climatic conditions which prevailed in that long-past age, when man was living in those temperate latitudes, in close proximity with animals both of sub-arctic and sub-tropical habitats. The fauna generally affords presumption of the prevalence of a colder climate, while the fact of a southern aspect and the sunniest nooks having been almost invariably chosen by the cave-dwellers of the Dordogne, points to the same conclusion, as does also the accumulation of animal remains in and about the habitations of man; for, although savages may not be over-wise in their notions of hygienic requirements, and we know that the Esquimaux in the present day live amid similar surroundings, the case is very different in a temperature such as now prevails in Southern France, where large collections of animal refuse would speedily be converted into fearfully offensive and deleterious decomposing masses. The occurrence of reindeer horns and bones in all conditions of age seems, moreover, to show conclusively that the same habitations were occupied at all seasons; while the absence of high mountains, among whose snows, as in the Pyrenees, the reindeer might have taken refuge from the summer heats, equally points to the probability of the prevalence of a colder climate than that which now obtains in the district.

The interest attached to the caves of the Dordogne district acquires additional force from the fact that the tradition of the most different and widely-separated peoples agree in representing the first

men spoken of in their history as living in caves. Homer attributed this mode of life to the savages of Sicily; Pliny refers to the Troglodytes or cave-dwellers of Ethiopia and other portions of Africa, and mentions that the Scythians, who pretended to an origin of higher antiquity than either Greeks or Egyptians, made their habitations in the recesses of rocks; in the mythology of the Scandinavians, men are represented as watching anxiously, from their cave-openings, the dreadful combats of their gods (or Æsir) with wicked giants. The Chinese have preserved the remembrance of a similar custom of living in caves; while we know, from the record of Scripture, that in the primitive ages of the patriarchs men dwelt in the grottos and caverns of Judea. This universality in the use of caves for human habitation necessarily gives the widest application to the results obtained in the explorations in the Dordogne Valleys; and here, as in the case of researches in other parts of Europe, we are struck with the remarkable similarity that characterizes the stone implements that have been found in different parts of the world. This primitive form of human industry may be traced over all Europe, from the fiords of Scandinavia to the plains of Greece, and from the shores of the Atlantic to the steppes of Russia. In Asia it crops up in Palestine, British India, the Malayan Archipelago, the isles of Japan, and on the frozen shores of the Arctic Ocean. In Africa it has been detected in nearly all the isolated regions opened to scientific research, and in our own continent through the length and breadth of the land; it has been met with from Behring's Straits to the elevated plateaux of Mexico, from Western Columbia to the shores of the Atlantic; from Peru to Terra del Fuego, along the flats of the Amazon and the Orinoco, through the forests of Brazil, and among the islands of the West Indies. One would naturally assume that, over so vast an extent of the earth's area, great diversities of form in the stone implements in use would be met with, but, as we have already remarked, such is not the case. In proof of the agreement between the forms of these primitive productions, we may mention that Messrs. Lartet and Christy give us side by side the representations of a lance-head of obsidian mounted on its shaft, such as is still in use among the natives of New Caledonia, and an unmounted flint lance-head from the valley of the Somme, left by man when the mammoth yet existed there, and when the river-level was seventy feet above its present bed, and had not cut out the broad valley through which it now flows; and yet the two implements are precisely similar to each other! The same may be said of a scraper of lydite, mounted in an ivory handle, used by the Esquimaux, and two unmounted flint

scrapers, the one from a cave in Périgord, the other from the valley-gravel of the Somme.

The exquisitely-finished lithograph plates of the *Reliquæ Aquitanicæ* abound in evidences of this wonderful similarity. We have on one plate polished axes from British India, South America, England, the Pacific Islands, and France, which look as if they had all been fashioned by the same hand. The Esquimaux skin-scrapers of to-day is identical with the implement with which the primitive native of Périgord scraped the skin of the reindeer, in those far-remote ages in which that animal roamed over the hills of Southern France. Besides tools of this kind, the use of which is easily explained, either by means of their individual forms or by comparing them with similar implements still employed by savages, there are objects, whose utility or mode of adaptation is less obvious. Thus, for instance, among the ornamentally-carved reindeer antlers, some stems or beams have been found, pierced with one or more holes, and cut so flat and thin that they could not have been used as weapons, or tools of any kind. It has been suggested by M. E. Lartet that these reindeer-horns may have been symbols of authority or rank, and he attempts to support his suggestion on the evidence afforded by Herodotus and Strabo, of the custom which prevailed among the Assyrians, of bearing seal-rings, walking-sticks, or rods, carved with various ornamental devices, such as birds, flowers, fruits, etc.; while, as we all know, a similar usage was common among the Hebrews in very ancient times, as confirmed by numerous allusions in Genesis and elsewhere, to the ratification of a pledge by the surrender of the signet, staff, or bracelet, belonging to the pledger.

Having thus briefly referred to the principal results obtained by the explorations of the five stations selected by Messrs. Christy and Lartet for the field of their researches, we now come to the latest and most important of the Dordogne Valley discoveries, viz., that of the cave of Cro-Magnon, or "Cramagnon," as the name stands on the survey-map. We are indebted to M. Louis Lartet, the son of the distinguished paleontologist above referred to, for a comprehensive description of the cave, which he regards as the selected burial-place of the remains found there; and it was to this promising young *savant* that his excellency M. Duruy, the Minister of Public Instruction in France, confided the task of superintending and reporting upon the scientific examination which the Imperial Government organized as soon as they were made acquainted with the fact of the discovery of the cavern. This discovery was entirely due to accident, and it is

possible that the human remains of Cro-Magnon might never have been brought to light if the construction of a railway embankment close by had not necessitated the removal of a considerable mass of rock, below which the workmen came upon broken bones, worked flints, and lastly human skulls. Fortunately for the cause of science, these important remains fell under the notice of the intelligent contractors of the railway, Messrs. Berton-Meyron and Delmarès, who, with a promptitude and good sense of which we wish there were more instances, at once stopped the works, and communicated with the eminent local paleontologist, M. Alain Laganne. The latter, recognizing the extreme value of the remains, informed M. Duruy of the circumstances, and without loss of time M. Louis Lartet was sent to the spot. This was in the early spring of 1868, and in the autumn of the same year the new number, Part VII., of the *Reliquiæ Aquitanicæ*, gave its readers the result of M. Lartet's explorations, as furnished by himself in his admirably illustrated report. From this valuable paper we can only extract a brief summary of the position and geological characters of the cave, before we proceed to consider the nature of its osseous remains.

The cave of Cro-Magnon is formed by a projecting ledge of cretaceous limestone, rich in fossil corals and polyzoans, about eight metres in thickness and seventeen metres in length. The bed which it overlies and to the destruction of which it owes its formation, abounds in the typical *Rynchonella vespertilio*. In the *débris* of this marly and micaceous limestone were embedded several hearths or foci of deposits, separated from each other by strata of the rock. In the lowest of these hearths were broken or calcined bones, charcoal, worked flints and portions of an elephant's tusk. In the highest and latest hearth lay bones, flints, bone implements, and drilled shells; and it was in this section, at the back of the cave, that the human skeletons were found. Above this osseous deposit rested a bed of *débris*, from four to six metres in thickness, and it was through this that the workmen were digging when attention was *first* drawn to the nature of these deposits, the character and mode of formation of which are such as to warrant us in carrying back the interment of these bones to a very remote period in the prehistoric age. It is worthy of notice that great slabs were found at different levels, but chiefly above the carbonaceous layers, some of which were so large as to require gunpowder for their removal. These had evidently fallen from the roof of the cavern, and by their fall have served to seal hermetically the various deposits below them. The presence of the remains of an enormous bear, of the

mammoth, the great cave-lion, the reindeer, the spermophile, etc., in the hearth-beds, strengthens in every way the assumption of the great antiquity of these deposits; while the form of the bone arrow-heads and worked flints, the predominance of the horse in comparison with the reindeer, and the absence of any engraving or carving, have led M. Louis Lartet to refer this station of Cro-Magnon to the age immediately preceding that which saw in France the first rude attempts to produce artistic ornamentation. Amid the human remains lay a great number of marine shells (about three hundred), each pierced with a hole, and nearly all belonging to *Littorina littorea*, so common on the Atlantic coasts. These have evidently been used for necklaces or other ornaments, as had been, probably, also a flat and oval piece of ivory, pierced with two holes.

The question of the origin and history of these early men of the Vézère M. Louis Lartet leaves to the anthropologist and ethnologist to decide, but he suggests that the presence among the dead, of Atlantic shells, may be accepted as an indication that, before they found conditions favorable for their mode of life among the limestone caves of the Dordogne Valley, these ancient tribes must have tarried on the western shores of France.

The discovery of the Cro-Magnon Cave, as might readily be supposed, excited the interest and speculations of the paleontologists of all countries, and in France every care was taken to submit the human remains to the examination of the best scientific authorities. Careful anatomical reports of the remains were drawn up by the eminent *savants*, M. le Dr. Pruner-Bey and Prof. Paul Broca, and from their papers, which have both been printed *in extenso* in the *Reliquiæ Aquitanicæ*, we will borrow as fully as our limited space will allow. Dr. Pruner-Bey divides his memoir into two parts: in the first he gives a description of the bones, and in the second he enters upon the question of the race, and probable physical and moral qualities of the cave-dwellers. As the bones were found all at the same level, it was conjectured that they were buried at the same time, or at short intervals; while their small number led to the inference that the deposit was the remains of a family burial-place. By the exercise of extreme care, four adult skeletons and one immature infant were recovered from the surrounding matrix. In regard to three of these, the skulls in a more or less perfect state, and some bones of the extremities, were recovered, but of the fourth individual there remained only parts of the calvarium, half of the upper alveolar process, and a piece of the jaw; and, judging from these fragments, they would ap-

pear to have belonged to a female, as did also one of the more perfect crania; and hence of these four adults two were women.

One of these skeletons, that of an old man, has better resisted decomposition than the rest, from having been protected by a thin coat of stalagmite. The other remains are in a more or less imperfect condition. These bones have all been carefully hardened, but, before they underwent this process, it was observed that they presented absolutely the same aspect and the same specific gravity (from want of gelatine, etc.) as the bones of reindeer and other animals with which they were associated. Dr. Pruner-Bey gives us a most minute anatomical report of every individual bone; and, as this is illustrated by plates prepared with the exquisite care and fidelity perceptible in all the delineations of this splendid work, his paper possesses the highest importance for all who are desirous of obtaining a reliable standard by which to compare the various remains of the prehistoric races. The conclusions which the doctor draws from the materials under consideration will probably not address themselves with equal force to the readers of the *Reliquiæ Aquitanicæ*; for, in the first place, he wishes to establish the proposition that all the crania of the Reindeer Age, which he characterizes as *Mongoloid*, constitute a double series, of which one approaches the Lapp and the other the Finn of our day; and, as a rider to this, he sets it down that the skulls of the Dordogne, departing somewhat from both these types, must be considered as belonging to the Esthonian type of cranium. He also considers himself warranted in inferring, from the form of the peculiarly low and projecting bony palate, that the language of the cave-dwellers of the Dordogne was neither Aryan nor Semitic, but probably analogous with that of the Finnish races, among whom we meet with a similar form of palate, and note a specially low phonological power. Dr. Pruner-Bey concludes from his examination that the cave-dwellers had massive bones, feet long and flat compared with the length of the long bones, arms short in relation to the pelvic limbs, with the forearm long relatively to the arm above the elbow. The form of the femurs, tibias, and fibulas, all of which are laterally compressed, and the condition of the metatarsals, impressed the learned anatomist with the idea that the individuals whose remains were found at Cro-Magnon had been more or less subject to rachitism. Any romantic notions that might be entertained by the unenlightened in regard to the paradisaical bliss of man in the earliest ages of his existence on earth will be rudely shaken by learning that the skull of the ancient man of the Dordogne showed, according to the doctor, evident signs of

caries of the frontal bones, and had a fistulous hole in the jaw communicating with the socket of one of the incisors, with traces of caries in the upper molars, while his left femur exhibited a depression of the surface, due to injury or caries. Still more sad to relate, the female skull showed a penetrating wound in the right frontal eminence, which, inflicted during life, had cicatrized on its edges. Near by lay a lance-head of chipped flint which perfectly fitted the aperture! The same skull wanted the two anterior thirds of the temporal regions, and hence Dr. Pruner-Bey concludes that the woman was killed, perhaps while pregnant, for there were found associated with the other bones fragments of the skull and some of the long bones of a human foetus. The picture drawn by this *savant* of the cave-dwellers is not flattering or attractive, but, as it is strictly in conformity with the data before him, we may assume it to be truthful; and in fact we can scarcely fail to recognize the savage slayer of a wife and an unborn infant in the figure built up before us with his heavy frame, powerful muscles, splay feet, large hands, enormously-developed jaws, short, turned-up nose, with widely-opened nostrils, as if to catch the wind from afar—"a man of sombre aspect, with an imposing stature, conscious of his strength, ignorant of moderating his passions by a cultivated *morale*, who could be violent and turn against the weaker sex the weapon intended to kill the game on which he depended for food."

From this picture of an ideal cave-dweller of Southern France we turn to the important paper by Prof. Paul Broca, general secretary of the Anthropological Society of Paris, "On the Human Skulls and Bones found in the Cave of Cro-Magnon, near Les Eyzies."

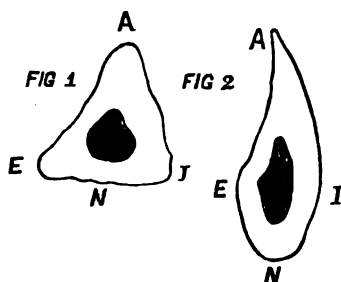
M. Broca found very many features of resemblance in the three more perfect skeletons, which seemed clearly to establish their affinity, and to characterize them as a particular race, different from all others at present known. They were of lofty stature, their bones robust; their tibiae flattened transversely; their femurs presenting immediately below the region of the trochanters a somewhat irregular curve; their ulnas having a relatively shallow sigmoid hollow; their pelvis was very broad, their skull very large and markedly dolichocephalic. This dolichocephalism not being due to the narrowness but to the great length of the cranium.

Prof. Broca found the Cro-Magnon femurs broader than any of the numerous human femurs with which he compared them, and approaching in regard to their breadth the femurs of the anthropomorphous apes; but it was in the tibiae that he observed the strongest diver

gence from the present normal human form, for here the transverse flattening of the bone is so different from that of existing human tibias that we must regard it as a marked characteristic of these early races.

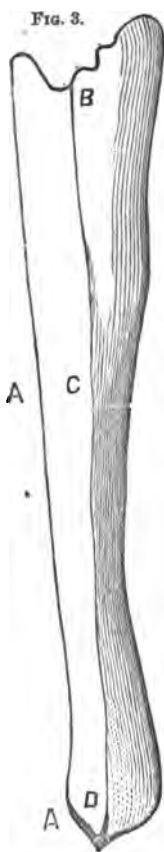
Assuming that our readers are thoroughly conversant with the form and general appearance of modern normal tibias, we shall at once proceed to show the chief points in which the compressed or platycnemic tibia differs from them. The difference is restricted to about the upper two-fifths of the shaft, below which the platycnemic bone is as triangular as the normal one.

The two diagrammatic sections here given, transverse to the bone at the nutritive foramen, will enable us to compare the triangular with the flat tibias. Fig. 1 represents the section of a triangular tibia. The three angles A E I correspond to the three edges, anterior, external, and internal. The side A E corresponds to the outer face, on which the *tibialis anticus* had its insertion; A I is the inner face, subcutaneous; E I , lastly, is the posterior face, in which the situation of the nutritive foramen is indicated by N ; the inner portion of this face (I N) corresponds to the surface of insertion of the *popliteus*, and its outer part (N E) to the surface for the *tibialis posticus*.



In Fig. 2, representing a section of a flat tibia, we see that the posterior face has an entirely different shape; for its outer portion (E N) forms part of the outer face, and its inner portion (N I) forms part of the inner face, so that the only part of this posterior face which has really a backward aspect forms merely a thick edge, in which the nutritive foramen opens at N . Such a flattened shaft has therefore only two faces and two edges: 1. An anterior edge A , or crest of the tibia, like that of the triangular tibias, but rather more trenchant; 2. A posterior edge N , which is formed above by the upper part of the popliteal line, and lower down by the tibial line; 3. An inner face formed in front by the inner face of the ordinary tibias, behind by

the surface of the popliteus; 4. An outer face, formed in front by the outer face of the ordinary tibia, and behind by the surface of the *tibialis posticus*.



The outer face of the flattened tibia (Fig. 3) has in its lower portion the breadth of ordinary tibia, but in its upper half it widens considerably; and through this widened portion a vertical salient line (B C) passes from above downward, exactly parallel to the crest of the tibia (A A), and lower down, about where the shaft begins to be triangular, it is continuous with the outer edge (C D), which gives insertion to the interosseous aponeurosis. On examining the inner face of the sharp shin tibia, we find that, throughout, the compressed portion of this inner face is widened. In the lower portion, where the shaft is triangular, we distinctly recognize the inner edge, which is not less evident than in ordinary tibia; but, in following this edge from below upward, we see, on coming to the level of the flattened portion, that it disappears entirely; in continuance with it some slight rugosities just indicate a longitudinal line, which traverses the inner face of the flattened and widened portion, just as the interosseous line passes along the opposite face. This line divides the internal face into two equal parts: the one (anterior) representing the inner face of the triangular tibia; the other (posterior) extending as far as the nutritive foramen, and consequently representing the inner moiety of the posterior face, the outer moiety of which, as seen above, is turned on to the outer face of the bone.

Prof. Broca strongly opposes the view advanced by M. Pruner-Bey, that the flattening of the tibia of Cro-Magnon is due to rachitism; but while he draws attention to their resemblance in this respect to the tibia of some of the Simiæ, he observes that this same platy-cnemid character has been noticed in the tibia obtained in 1864 from the dolmen of Chamont (Oise) and of Maintenon (Eure-et-Loire), and recently in the human skeleton found by M. E. Bertrand in the Quaternary Drift, at Clichy, near Paris. Mr. Busk, the distinguished president of the College of Surgeons, London, had also proved by his examination of the bone-caves of Gibraltar, in 1863, that the tibia

found there all presented a similar platycnemic character. On the other hand, M. Dupont has shown that in several of the Belgian caves the human tibias belonging to the Reindeer Period are prismatic and triangular like our own.

Prof. Broca gives us a very interesting series of measurements to exhibit the extraordinary transverse width of the ascending rami of the Cro-Magnon jaw, which, together with the great capacity of the skull, forms one of the most striking features of difference in the cranial type presented by the cave-dwellers. In regard to the latter characteristic, it must be observed that the skull of the old man was the only one sufficiently perfect to be gauged with shot; but, thus tested, the capacity was found to be 97.038 cubic inches, while the capacity of the female skulls, taken approximatively, was found to be about 94. cubic inches. From M. Broca's table of the transverse diameter of the ascending ramus in different races of men and animals, we can only give the following: For the old man of Cro-Magnon, 1.929 inches; Parisian of the present day, 1.575; Basques of the fifteenth century, 1.457; in a Javan of the present day, 1.654; in adult *Troglodytes niger*, 1.890; in adult *Gorillacthego*, 2.874; in adult female *Gorilla Savagii*, 2.205 English inches. Hence, M. Broca considers that the old man of Cro-Magnon must take his place between semi-savage or uncivilized races and the anthropomorphous apes, although he thinks we are bound to assume that this man was probably that of an exceptionally large and strong conformation.

In reply to M. Broca's elaborate and exhaustive paper, with its highly-interesting scales of comparative measurements (which are all incorporated in Nos. VIII. and IX. of the *Reliquiæ Aquitanicæ*), we have the very suggestive and important remarks of M. de Quatrefages, Professor of Anthropology at the Museum of Natural History, Paris, made at the meeting of scientific societies at the Sorbonne, 1868. This able physiologist and anthropologist, in admitting that the importance of the discoveries at Cro-Magnon can hardly be too highly estimated, is anxious to warn his hearers of the danger and fallacy of assigning significance to characters of which in effect we know neither the cause nor the value, and he strongly criticises the tendency shown by his colleagues, Messrs. Pruner-Bey and Broca, to regard certain characters as determined signs of inferiority or of superiority; very aptly illustrating the unsoundness of the practice which he condemns, by remarking that, although M. Pruner-Bey sees a sign of inferiority in a faintly-marked disposition of the parietal bones to form a ridge at the sagittal suture, as found indeed occasionally among

some races of men who are justly placed near the lowest stages of civilization, he himself has noticed it recently in a perfectly pure white man—one of the most distinguished of the delegates, who had come to the Paris Congress of Science from America, in whom it was more strongly marked than in any skull in the Paris Museum.

After that, M. de Quatrefages may surely be pardoned for begging for the exercise of a little caution on the part of his brother anthropologists, before they endeavor to support preconceived views of the origin and descent of the human race, by giving undue significance to assumed agreements between fossil man and apes. He thinks that the view of Europe having been originally peopled by a race of only one cephalic conformation must be wholly laid aside by the discoveries of Cro-Magnon, and he agrees with M. Broca in assuming the co-existence of both the brachycephalic and the dolichocephalic types, and sees in the cave-dwellers of the Stone Age the representatives of the two forms.

Here we must close this review, which has already far exceeded the limits we had intended to set to it. Our excuse for its excessive length must be the great interest of the work, which even in its present incomplete form we may conscientiously recommend as a model for similar publications, both in regard to the matter and the exquisite finish of its printing and lithography; and we earnestly hope that Mr. Christy's example may be speedily followed by others among the numerous English Cræsi, who often have the will as well as the means of benefiting scientific inquiry, and only need the requisite suggestions for leading them to undertake some *opus magnum* like the present, whose cost must always prove an obstacle in the way of its publication by authors or publishers of ordinary pecuniary means.

Spiritualism.¹

IN all ages of the world, and among all nations, savage and civilized, among cultivated Europeans and barbarous Africans, or North American savages, certain subjective phenomena, or such as arise within ourselves, and result from obscure conditions of the brain and nervous

¹ *Physics and Physiology of Spiritualism.* By W. A. Hammond, M. D. New York: D. Appleton & Co., 1871. *Spiritualism and Animal Magnetism.* By Prof. G. G. Zeffl. London: Robert Hardwick, 1871. *Spiritualism: a Narrative with a Discussion.* By Patrick Proctor Alexander, M. A. Edinburgh: Wm. P. Nimmo, 1871. *Report on Spiritualism of the Committee of the London Dialectical Society, together with the Evidence, oral and written, and a Selection from the Correspondence.* London: Longmans, Green, Reader & Dyer, 1871.

system, have been confounded with what are supposed to be external or objective realities, or spiritual manifestations from

"that undiscovered country,
From whose bourn no traveler returns."

Many men in all ages have seen and conversed with spirits, but few, like Nicolai, have been ready carefully to investigate their sensations and perceptions, and seek, like him, to trace them to some disturbing element within. It is easier to believe than to investigate, and especially when phenomena are confirmed by the evidence of our sensations, however deceptive and treacherous, under certain conditions, these can be shown to be. "If I am not to believe the evidence of my own eyes and ears," says one, "what am I to believe? Is not seeing believing? if not, what is the value of all testimony? If a person with the strong common-sense of old Dr. Sam Johnson hears the voice of his mother calling, 'Samuel! Samuel!!' is he not to *believe* that he hears it, though a hundred other doctors, the aggregate of whose brains would not make the sum total of his, tell him he is deceived by his sensations, and that his mother is miles away from him in the country? Is not hearing believing, and if not, pray, what is?" A sick, hysterical, perhaps insane woman, hears the voices of her children in distress, calling to her from an upper room for help, and prays the physician or attendant earnestly to be allowed to go to them: is she to be convinced by science or reason that they are not there, but that the voices she hears are hallucinations; or, if allowed to go to the spot whence the voices proceeded, and not finding the children, is she to be convinced by reasoning that they have not been spirited away to another place, and does she not continue to hear them in another place? Again, to mix up the strong with the weak, for all are subject to like infirmities, when the great reformer, Dr. Martin Luther, in the midst of his deep reflections and earnest strivings with cardinals, popes, and devils, sees the prince of devils enter his cell *in propria persona*, is he to doubt the evidence of his eyes, and not hurl an inkhorn at him? When Bonaventura and Leo, saints of the calendar, assert that St. Francis of Assisi was frequently during prayer raised from the ground into the air, so high that they could only touch his feet, are we not to believe that the position and known laws of gravitation have been suspended, rather than that these holy saints have been deceived by a highly-nervous, excitable, and imaginative temperament? When the holy but hysterical if not epileptic or cataleptic St. Theresa informs us that sometimes, in prayer, her soul was so elevated that her whole body was carried upward with it into

the air, we must believe one of three things—either that the laws of gravitation were suspended, that the holy saint meant to deceive us, or that she believed in the reality of sensations which had arisen only in her imagination from a morbidly-excited physical or psychical condition. We incline to the latter view of the case, as not only more scientific, but reasonable and charitable; and so, when Calmet gives a list of ten persons who were lifted by some unseen power, and says that they were so spiritualized that they could run with great swiftness, and so buoyant that they were blown about like soap-bubbles, while we place implicit confidence in the assertions of the good priest, we must attribute the phenomena to the same causes. But such instances, let it be distinctly understood, are not drawn exclusively from the ranks of those professing the Catholic faith, for the history of Protestantism from Luther to the present time abounds in such illustrations. That of New England is rich in such material. Why, then, if living bodies can be so elevated by spiritual (or nervous) influences, need it be thought a thing incredible that inanimate bodies can also be made to move without bodily contact, and that drums, fiddles, accordions, and tin pans, can be made to fly about in the darkened atmosphere of a room, and over the heads of those in earnest spiritual *séance*—that tables be moved, and communications be rapped out on their surfaces, in murderous English and halting orthography, from the spirits of George Washington, Benjamin Franklin, or William Shakespeare? Unfortunately, in taking the statements of these men, eminent while on earth, we cannot believe that their spirits have been in a state of “progression” while in the spirit-land; they have not had the advantages of good society, and have evidently lost the faculty of elegant and correct utterance. They even seem to have so much degenerated since they were on earth that they sometimes talk what we must designate as *twaddle*, for want of a more elegant though perhaps less expressive term.

With all due deference, however, we may be allowed to suggest that this *may* arise from a certain intellectual muddiness or want of early educational advantages on the part of the mediums through whom their poor tortured spirits are made to speak to us mortals below.

Extremes are said to meet, and this age of the world is marked not only by an arrogant skepticism as regards every thing spiritual and divine, but by a superstitious credulity that is ready to swallow the most crude and ill-concocted absurdities, without either the ability or the inclination to give a reason for faith in the one or disbelief in the

other. The same generation that gave us a Hugh Miller, furnished also a Huxley and a Darwin; and the names of Faraday and Agassiz are yoked with those of Home and Owens, and Humboldt and Kane with the Davenport brothers and the Fox sisters. Out of this chaos of ideas and opinions order will ultimately be brought, but it will require time, patient waiting, earnest endeavor, and, moreover, a faith which, while it is ready to believe all things, and to hope all things that are for the good of mankind, is, at the same time, fully determined to "*prove* all things, and hold fast only to that which is good." Earnest and untiring men, in all countries, are toiling at this strange problem, which is now known only as spiritualism. The plodding sons of Germany are bringing their mighty powers of patient, critical analysis to bear upon its facts, and real or fancied phenomena. The brilliant scientists of France are also beginning to take a deep interest in the question. De Boismont has already spoken in a volume, characterized by great beauty and power, as well as by able analyses, and scientific and historical research—a volume which, though not specially directed to the investigation of the subject in question, has probably thrown more light upon it than any thing that has been published during the last half century.¹ In Scotland, the subject is beginning to receive that attention which it requires, if not deserves, as is shown by the monograph of Mr. Alexander; and in America, which claims the doubtful honor of first agitating this new and modern phase of the marvellous, Dr. Hammond has given the subject his attention in the little monograph noticed above.

The most important investigation of the subject, however, if we are to judge by the extent of the labors and number of investigations, is that contained in the "Report on Spiritualism of the London Dialectical Society," a volume we here propose to analyze as carefully and thoroughly as our space will permit.

The report and evidence contained in this volume were presented to the London Dialectical Society, and by resolution ordered to be entered on its minutes. The thanks of the council were given to the committee, in the usual way, for the indefatigable manner in which they had discharged their duties; but when said committee requested that their report should be printed, by and under the authority of the society, the learned body respectfully declined to accede to the request. In consequence of this decision, the committee, unwilling, no doubt, that matters of the deepest importance to science, religion, and the spiritual and material welfare of mankind, should be lost to the

¹ See De Boismont, "Rational History of Hallucinations."

world, resolved, as other committees had done before them, to publish their own doings, and the result is a volume of 390 pages, exclusive of title-page, list of works on spiritualism, index, etc., etc. A formidable array of names, with their varied appendices, ranging through the whole catalogue, from simple Esq. (whose only certain significance in modern times is, we believe, synonymous with J. P.) up to the more pretentious titles of M. D., Ph. D., D. D., M. R. C. S., and F. G. S., is presented, while three of the committee have the simple, honorable, motherly prefix of Mrs. We see no Miss among them, but why spinsters, young or aged, were ineligible, we are not informed. Of all this formidable array of names, we in our ignorance only recognize two as familiar to the scientific world, viz., Prof. Huxley and Mr. G. Henry Lewes. Those gentlemen were honored with an invitation to coöperate, but respectfully declined the offer, in letters which we propose to bring forward in the proper place. The parent committee, duly organized, proceeded to divide itself into six sub-committees, and these went to work to investigate, by personal experiment and test. The parent committee held fifteen meetings, and received evidence from thirty-three persons, describing phenomena which had occurred within their own personal experience. They also received written statements from thirty-one persons, and invited the coöperation of many distinguished scientific men and women, and while successful in obtaining much evidence from the believers in the phenomena, and in their spiritual origin, they failed, from want of sufficient interest in the matter, no doubt, to obtain much rebutting testimony from those who attributed them to fraud and delusion. Some pretty positive testimony, however, was educed as to this, as will be seen as we proceed with the inquiry. Some of the witnesses ascribed the phenomena observed to disembodied spirits; others, it would seem, to *embodied* spirits, for they saw and touched their hands, some to Satanic influences, some to psychological causes, and others to imposture and delusion. In short, there seems to have been more unanimity as to the facts and phenomena witnessed, than to the explanation of the same.

Here has been the difficulty, for the facts and phenomena have been known and observed from the most remote times, and modern science has done much toward their elucidation; but the laws of those manifestations, and the conditions under which they appear, are not yet fully determined, and, until they are, we must patiently allow curious, hysterical, if not insane dabblers, to attribute them to spirits, devils, or whatever they may see fit; and, as they sit about their tables, in the dark, like the witches in "Macbeth" about their infernal caldron, calling up

"Black spirits and white,
Red spirits and gray,"

we will not quarrel with them in their amusement, so long as it is innocent, and not detrimental, as we fear is sometimes the case, to physical and mental health. We will not even seek to dispute their facts and phenomena, if they will not ask us to adopt the varied conclusions they seek to educe from them, but say with Hecate, in the immortal tragedy referred to above :

"Oh, well done, I commend your pains,
And every one shall share i' the gains ;
And, now about the caldron sing
Like elves and fairies in a ring,
Enchanting all that you put in."

We commend this more interesting spiritual *séance*, to which the above lines refer, to the careful attention of all the faithful ; it is, without doubt, the finest on record. (It can be found in "Macbeth," Act III., scene 5, and Act IV., scene 1.) But our business at this time is not with the *séances* of witches, but those of the committee and sub-committees of the London Dialectical Society, and we proceed at once to consider the facts and phenomena set forth, and the conclusions drawn, adding such running comments of our own as we may think called for.

Sub committee No. 1 held forty meetings. Those meetings were held by gas-light. No paid mediums were employed, but the mediumship consisted of members of the sub-committee "of good social position and unimpeachable integrity, having no pecuniary object to serve, and nothing to gain by deception." A medium was necessary, in order to elicit the more complete manifestations, though, without the presence of such, the same phenomena occurred, but with greatly diminished force.

The conclusive results arrived at by Sub-committee No. 1, are—1. That, under certain bodily or mental conditions of one or more of the persons present, tables were moved without muscular force, or contact with the body of any person present. 2. That sounds came from solid substances, under like circumstances, and that these forces are frequently directed by intelligence. Sub-committee No. 1 reports that, in all, fifty movements of the table were made, on eight different evenings, and they conclude that there is a force capable of moving heavy bodies, without material contact, and which force is in some manner dependent upon the presence of human beings. The committee do not pretend to set forth any opinion as to the nature of this force, but simply record the fact of its existence.

Sub-committee No. 2 expresses more confidence in the nature of the forces at work in bringing about the manifestations in question. After bearing testimony to the table-liftings and rappings witnessed by Committee No. 1, they make some statements which tend to throw some faint light on the habits of denizens of the spirit-world, leading us to think that, even in the shadowy land of the hereafter, there may be necessity for temperance societies. Upon one occasion, says the committee, after we had concluded a *séance*, and while we were taking refreshments, the rappings returned with great vigor, proceeding simultaneously from various parts of the room. On asking the presumed intelligences their names, they said they were the spirits of those who had been in communication with us during the evening, and, like the members of the "circle," were in a happy and merry mood, and did not care to leave us. One of the party jocularly drank to their health, and asked them to respond, which they did by volleys of raps, indicative, as they informed the circle, of laughter and good-fellowship. Each ultimately bade the circle good-night by a succession of loud raps. It would seem from this that not only terrestrials but celestials were, upon this occasion, "Keeping their spirits up by pouring spirits down." Lest the above be deemed not sufficient to stamp the value of the testimony of Sub-committee No. 2, we conclude our notice of these labors with the following rich extract: "At a sitting, during which the rappings had been unusually sonorous and fluent, one of the party asked the presumed spirit then in communication to state when he died, and, though the question was somewhat persistently repeated, no answer was returned. This apparently abrupt termination to the most successful *séance* we had yet had caused us much surprise, and we were conversing on the subject, when it was remarked that, as the presumed intelligences claimed to be spiritual, they probably rejected the application of such a term as death to themselves, or their state of existence, it being likely that, of whatever import death might be to the body, it would, as concerning the spirit, be the continuation of life under a new form. Scarcely had the speaker concluded, when loud raps again resounded from the table, such being given, as we were informed, by way of assent to the remark just made. Arising out of this, a conversation of great interest took place, in which, to the faithful, life, death, and immortality, were brought to light. Death, the committee were informed by the intelligences, was, so far as the body is concerned, of comparatively trivial importance, but, as regarded the spirit, it was a birth into a new experience of existence; that spirit-life was in every respect human; that friendly intercourse and companion-

ship were as common and as pleasurable in spirit-life as on earth ; that, though spirits took great interest in earthly affairs, they had no wish to return to their former state of existence ; that communications with earthly friends were pleasurable and desired by spirits, being intended as a proof to the former of the continuance of life, notwithstanding bodily dissolution ; that spirits claimed no prophetic power." The intelligences also informed Sub-committee No. 2 that disputation among themselves at a *séance* was a disturbing element, but that they liked joking and fun occasionally. Now comes the most curious piece of information yet vouchsafed the favored Sub-committee, which is this, that they (the spirits) know the Dialectical Society, and were interested in its investigations of spiritualism, but that they did not know whether such investigations would have any good results. Does not this latter statement of the spirits manifest some of that prophetic power which they had just disclaimed? With the spirits, we also are somewhat doubtful as to any good results, either to science, or the scientific character and status of the learned Dialectical Society of London, by its investigations.

We must pass by much that is brought forward by Sub-committee No 2, which, though of good interest no doubt to the faithful, will by others be regarded as little better than what has been designated as twaddle, and that, too, of a very insignificant and unscientific character. The investigations of Sub-committee No. 3 were chiefly confined to a measurement of the forces and amount of pressure necessary to the table-tilting, and it was observed that it was only when certain persons were present, that any evidence of the force and intelligence was presented. Two friends were particularly noticed as indispensable, a clergyman and the wife of another clergyman of the Church of England. They report that, though the phenomena they witnessed were comparatively unimportant, they raise in their opinion some important questions in science and philosophy, which deserve the fullest examination by capable and independent thinkers. On the whole, the report of Sub-committee No. 3 is about as sensible as any, if we except that of No. 4, who declare that they saw nothing worth recording.

Sub-committee No. 5 was appointed to meet the great medium Mr. Home, for the purpose of investigating the alleged spiritual phenomena presented through his agency. The first *séance* lasted two hours, but the manifestations were of the most trifling character, only a few feeble raps and a slight movement of the table, of a swinging irregular kind, being observed. General — was affected with a slight

convulsive movement of the arm, which was beyond his control. A pencil was placed in his hand, but the writing could not be deciphered. At the second *séance*, the medium, Mr. Home, was not in working order, or the spirits refused to be called up, though once it is reported he seemed slightly affected, for he started, and exclaimed, "Oh!" covering his face with his hands. One other member of the circle stated that he was unable to move his arm, and that the muscles were quite rigid. No abnormal symptoms, however, could be discovered. At the next *séance* Mr. Home was able only to draw from the table a few feeble raps. The fourth and last *séance* seems to have been quite as unsatisfactory as the others. Mr. Home was sick, and only the most feeble phenomena were educed, and the members, who came prepared to witness the most extraordinary levitations of Mr. Home, were doomed to disappointment. He, however, mentioned a fact which seems to throw great light on the source of the phenomena, indicating, it seems to us pretty clearly, that they have their origin within his own organization. Mr. Home explained that such phenomena, produced by his agency, were very uncertain, and that he could not produce them at will. Spiritual manifestations, it would seem, even with such acknowledged mediums as Mr. Home, are largely dependent upon bodily conditions, and when he is sick he must exclaim with another mighty conjurer:

"The spirits I have raised abandon me."

Sub-committee No. 6 met four times, but seem to have been more unsuccessful than all the others, if we except No. 4, which saw "nothing worthy of report." This committee were not quite as unfortunate, but whether they saw any thing "worthy of report" the reader shall judge for himself when told what they really did observe. A lady visitor brought with her two little girls, aged apparently about eight and ten years, whom she declared to be mediums. The children were placed at a small chess-table, which they proceeded to rock to and fro, to their own intense delight and the amusement of the company. The report of this sixth and last committee ends with the narration of this interesting little circumstance, and the remark that at no other meeting was there the least pretence of any spiritual manifestations.

We now come to notice the communications from individual members, and the first is that of Dr. James Edmonds. The doctor's experience was mostly with the Davenport brothers, and he appears to have investigated honestly and carefully. We have space only for his conclusions. "I have no hesitation," says he, "in expressing the conviction that none of the extraordinary phenomena will ever

come within the range of real investigation of a competent observer without at once being divested of all mystery. . . . On many occasions," says he, "I have offered a bank-note of considerable amount to any person who would read the note while in my pocket or in a book. Hitherto the challenge has always been evaded. I still hold it open." The thoroughly contemptible nature of the phenomena, the utter absence of any new information from these so-called spirit-visitants, are indisputable and cogent facts. In face of the fact that Faraday revealed the whole science of magnetism, this argument tells against the supposition that there is any real truth or coherence in the phenomena, and goes to show that they are phantoms of the brain—"such stuff as dreams are made of," or tricks of impostors. Some of the phenomena, undoubtedly genuine, are due to unconscious action, caused by the strange circumstances under which the *séances* are held. Such phenomena are marvellous to those only who do not know how small a part of themselves is made up of their own consciousness. Other phenomena there are also genuine, but purely subjective. Such are the nervous twitchings, the "spirit-eyes," the hysterical fancies, memories of the past, and the unconscious cerebration that occurs in many persons under the distracting suspense and mystery of the *séances*, especially the dark ones. Such *séances*, it should be observed, are extremely injurious to delicate organizations, and undoubtedly tend in many instances to disturb the nervous system, if not absolutely to unhinge the mind. Those acquainted with certain phases of insanity, as they are manifested in our large hospitals, and who have learned by experience the operations of disturbed nerves, brains, and minds, and the influences of such upon surroundings, when they recollect how firmly the insane believe in the most extraordinary hallucinations, delusions, or illusions, will easily trace a close resemblance between the condition of these patients and persons under the excitement of a spiritual *séance*. Many illustrations occur to the writer, taken from years of experience in a large hospital, which cannot be brought forward in this place. Dr. Edmonds, in a postscript to his communication, says that "he has learned that, out of the comparatively small number of persons who were active, either as advocates or mediums, in connection with the phenomena which came under his own observation, one has been the subject of well-marked mental disturbance; another has been confined in a lunatic asylum; and a third, a comparatively young man, a few weeks after a dark *séance*, was seized with a mysterious form of paralysis which has incapacitated him from all business.

"Doubtless," continues Dr. Edmonds, "very truthful persons will narrate things which are inexplicable apart from the hypothesis of

supernatural intervention, but I have seen enough to convince me that such accounts are the result of self-delusion in one shape or other, and often the narrative is the offspring of the imagination, rather than the cool narration of facts. . . . At present," says the doctor, "in conclusion, I can only arrive at the conviction that the phenomena have their origin in unconscious action or self-delusion, unless they are the result of imposture; certainly they are mischievous and delusive to the last degree."

The opinions set forth by Mr. Jeffrey are so clear, and express so fully the views entertained by other scientific men on the subject of the so-called "spiritual manifestations," that we reproduce them in this place.

He says: "1. That such exhibitions of what is called 'trance-mediumship,' as have come before us, have been to all appearances nothing more in some cases than ordinary hysterical affections; while in others they have borne the characteristics of wilful imposition; and that the trance utterances of the mediums have been outrageously incoherent and absurd. 2. That such writing and drawing mediums as we have seen, have simply guided pen and pencil in the ordinary way, the only peculiarity being that the operators sometimes allowed themselves to be swayed by fantastic impulses. 3. That we have not been able to obtain, in response to our efforts, by means of raps or otherwise, communications of well-marked facts not known at the time, and subsequently substantiated; that no information of any practical value, no new thought, no fresh expressions of worthy sentiments have been conveyed, but that the general character of the communications has been frivolous and absurd."

This remark of Mr. Jeffrey has already been illustrated by what has been brought forward heretofore, and will be more fully when we come to consider the minutes of the committees, and the correspondence and communications of those who were invited to participate in the investigation.

"4. If the communications," says Mr. Jeffrey, "be accepted as messages from the spirits of departed relations and friends, a belief in them cannot be reconciled with an exalted conception of the state of disembodied souls, and that the alleged revelations are for the most part repugnant to minds of a high religious and spiritual faculty."

This also we propose to illustrate from minutes and reports of *séances* in the sequel. "5. That the theories propounded by the witnesses examined before the committee were vague and contradictory, and that there is a scarcity of evidence from persons accustomed to

investigate in a scientific manner physical facts which these phenomena are alleged primarily to be. 6. That the phenomena which have been the subject of our inquiry are of a kind peculiarly open to imposture and credulity; that many of the votaries of spiritualism have such an eagerness of faith as to render their evidence unreliable; and that the boundary between wilful falsehood and self-deception is not a clearly-defined line, but an extensive mental territory, on which many popular delusions have for a time played their pranks and then disappeared. 7. That nevertheless, several of us have witnessed some remarkable phenomena which we have not been able to trace to imposture or delusion; and that these, added to the gathered testimony of respectable witnesses, justify our recommendation of the subject to further cautious investigation."

It should be observed that, in the conduct of the inquiries and investigations of the committees, those who were deemed skeptical were placed from the outset at a disadvantage, as all the arrangements were made by the faithful, and the conditions to be observed were prescribed by them. The skeptics were ordered to place themselves at particular parts of the table, or apart, perhaps, from the table, and enjoined not to mar the manifestations by obtruding their adverse influence. Some of the more skeptical investigators were frequently informed that their presence was calculated to interfere with the free operation of the spiritual powers. The spirits, however, did not often object to the presence of their adverse influences, but allowed them to see the table-movings and hear the raps. At one meeting the faithful were positive that the spirits had done their best, and that *bona-fide* spiritual manifestations had been given similar to all other phenomena of a like character. The doubters, however, were positive that the raps and movements were all produced by a particular individual. The judgment, or rather the evidence of the senses, of the doubters, was subsequently found to be correct, by the confession of the supposed offender. Had the medium been a little more shrewd, and the amateur a little less skeptical and adroit, this accident would, perhaps, not have happened. Nevertheless, it is not to be supposed that even the most faithful mean to deceive; most are honest, though many are evidently deceived—the victims of a delusion, or of an irresistible impulse to deceive and mystify others. Nevertheless, it could not be denied by the most careful and skeptical that there is frequently manifested a certain intelligent force not fully understood, and, though there are strong reasons to lead us to suspect that this proceeds from the nervous systems of the individuals oper

ating to produce the so-called spiritual phenomena, still there is at present not sufficient evidence to show that this is the case. There is also no evidence whatever to show that the spirits of the dead are in any way concerned in the production of the phenomena witnessed and verified by many careful, honest, and intelligent observers. On the contrary, the evidence pointed to the opposite conclusion. All the conditions under which the phenomena presented themselves were entirely consistent with the exhibition of a force emanating from some person or persons present. The nature of this force, however, is yet to be determined, and it is to be hoped that ere long it will receive that patient and careful attention and investigation which the cool, unprejudiced scientific observer alone can give it. By such only can the psychic force, hitherto so little understood, be properly measured, and its character fully tested, and the entire question of the mutual relationship in man of life, mind, and body, be elucidated.

We now come to make our extracts in illustration of this modern doctrine of spiritualism, from the minutes of the committee, and in these we shall allow the true believers to speak for themselves, and, as much as possible, in their own language. By this manner of procedure we shall not lay ourselves open to the charge of misrepresentation. Our own views of the subject can be gathered from what has preceded. As the ladies should have precedence in all things, spiritual as well as material, we will commence by introducing Mrs. Harding:

"For twenty-one years," says Mrs. Harding (i. e., since the first knockings in Rochester in 1849, which first drew attention to the subject of spiritualism), "disembodied men and women had been endeavoring to communicate with their friends on earth, through the agency of what might be called 'vital magnetism.' The spirits state that the principal difficulties they have had to encounter have arisen mainly from two causes: 1. The subtle and ill-understood nature of the magnetic fluid used to produce the phenomena; 2. The materialistic tendencies of the age, which operated to retard investigation and neutralize the manifestations. The communication was established somewhat on the principle of a galvanic battery, requiring for its operation *three* elements, viz.: 1. A person called a medium; 2. A spirit in magnetic report with the medium; 3. A certain condition of the atmosphere, in which to produce the manifestations. The mediums," says Mrs. Harding, "must be possessed of an excess of vital fluid of a negative quality; the medium spirits (for there are

medium spirits as well as non-medium spirits) must give off an excess of vital magnetism of a positive quality ; so that the medium and the spirit always stand related to each other as negative and positive, the spirit being always positive, in order to be able to produce phenomena. Thus, the two stand in relation to each as the copper and zinc in a galvanic battery, while the atmosphere represents the solution. Extremes of heat and cold were favorable to the manifestations : thus, the inhabitants of arctic and tropic regions, as well as those who dwell in mountain-districts, were frequently observed to manifest medium-power in a marked degree. Mrs. Harding herself had found her own medium-powers considerably diminished in force since leaving America, and so liable to be influenced by change of scene and climate, that a visit to Scotland would have the effect of increasing them again. Snowy weather, or thunder and lightning, afforded favorable conditions ; moist and damp weather invariably the contrary.

2. "The human magnetisms composing the spirit-circle, above all other elements, exert the most considerable influence on the character of the manifestations : thus, a strongly antagonistic state of mind in any one of those forming the circle would probably, by developing a positive influence toward the spirit, neutralize the manifestation."

We have brought forward this extract to illustrate the importance attached to physical conditions for the satisfactory manifestation of spiritual influences, and also the weight given by believers to certain magnetic, electrical, and barometrical conditions. Any strong emotion, Mrs. Harding considered, was also detrimental to the exercise of spiritual power. Upon one occasion she stated : "A medium, Mr. Conklin, was so disturbed, at a *séance* in Washington, by the discovery that one of the gentlemen present was no other than President Lincoln, that the manifestations were entirely discontinued, and did not reappear till the medium had been restored to his normal state of mind." This, according to the theory of Mrs. Harding, was because any strong emotion rendered the magnetism positive, thus neutralizing the action of the spirits. One enthusiastic believer brought to the spirit-circle such a peculiar quality of magnetism as invariably to suspend the manifestations whenever he appeared. This continued until a short time before his death, when a change took place in his physical system, and the phenomena were produced in his presence with perfect freedom. In answer to a question, Mrs. Harding stated that she believed, with Lord Lytton, that the spiritual manifestations were more remarkable in proportion to the amount of electricity in the atmosphere. This is Mrs. Harding's theory of the visibility of

spirits: it is brought about, as it were, by crystallizing the magnetic and other emanations from those present, around their own invisible spirit-forms. She herself had seen a spirit-hand, and felt it within her own.

The next person we bring forward is Mr. Jencken. He bears testimony to having observed various kinds of spiritual phenomena, which he notices in groups: 1. The levitations and elongations of the body; 2. The raps or knocks, and telegraphic signs, which he claims that all have heard who know any thing of spiritualism, and declares that messages have been spelt out by the tilting of a grand-piano in his own house. Sentences have also been spelt out by the vibrations of the strings of the piano, touched by invisible hands. The third group of Mr. Jencken consists in the uttering of words, and the production of musical sounds. He says that, once at the house of Dr. Gully, at Malvern, he heard three voices of invisibles chanting a hymn to the accompaniment of an accordion. This (tell it not to cultivated ears, lest such may never wish to enter the dim domain of the hereafter!) seems to be the favorite musical instrument of the spirits.

The *fourth* group of phenomena includes the drawing of flowers, figures, and the writing by direct unseen spiritual agency. Spirit-hands are sometimes seen, are usually luminous, and appear and disappear instantaneously. He says he has been able to submit a spirit-hand to pressure, and also to determine its temperature, which (strange to say) was about that of the temperature of the room, by means of a delicate thermometer. "Spirit-forms," says Mr. Jencken, "usually appear with head and bust developed and very luminous, the outline rarely well defined, and generally the form seems to float rather than to walk. Once a spirit-form cast a shadow, and slightly obscured the light of a gas-burner. Sometimes these forms appear quite opaque and solid. Sometimes they remain visible for several minutes, or long enough to be drawn, as Blake drew his visions, his ghosts of fleas, etc., on the canvas. Once, at the house of Dr. Gully, a luminous form appeared, spoke several words, audible to all, and then walked to the fireplace at the end of the room, the floor vibrating to the heavy footsteps. Once a figure, draped in what appeared a light, transparent, loose gauze or veil, passed to and fro, imaged on the wall, which had become luminous; Mr. Home, who was in a trance-condition, warned them not to be too positive or too intent, lest the appearance vanished." As to the identity of the spirit-appearances with beings that have formerly lived on earth, Mr. Jencken seems to entertain no doubt he has recognized them by the familiar voice, the words spoken, and the meaning of the words. Mr. Jencken then proceeds to develop his

theory of all things spiritual, visible and invisible; and, though he appears to possess, as Byron has it, "new mythological machinery and very handsome supernatural scenery," we confess our inability to comprehend fully what he is driving at, and, unlike him, shall not attempt to convey to others what we do not comprehend ourselves.

The next witness was Mr. Simkiss, who said: "I have witnessed a great number of neurologic spiritual manifestations, and, after deducting a great percentage for mesmerism, imposture, and hallucinations, there remains for me no possible alternative but to acknowledge that some persons who are physically dead have still a conscious existence, and can, by operating through the nervous systems of certain sensitive individuals, called mediums, give unmistakable evidence of their identity." Here Mr. Simkiss brings forward some curious facts to illustrate his position, but we see no reason why they should not be placed with the forces he deducts above, particularly hallucination. Many cases, equally interesting, are recorded by De Boismont and others. That all he experienced originated within himself, without regard to the denizens of the spirit-world with whom he was so strongly and suddenly put in communication, we feel fully convinced. That all these things arise from physical conditions, which come and go, and over which we can exercise little sudden control, we may infer from Mr. Simkiss's own words: "In my experience," says he, "I have met not only with success but with many disappointments, and now rarely waste much time upon the spirits, vainly waiting for them to communicate, for I know that, if they choose to withhold themselves, they will not come when we do call, while, on the other hand, they will sometimes manifest themselves at times and in places the most unexpected. . . . Beyond solving the question, 'If a man die shall he live again?' by the very fact of spirits communicating and proving their identity, there is to me," says Mr. Simkiss, "little that is consistent or reliable in what is revealed through different mediums; and perhaps this is well, for, if a man were led to rely much upon spirits for advice, his own judgment and energy would be in danger of being weakened thereby."

If the momentous question propounded by Job is only to be answered, to the satisfaction of such men as Mr. Simkiss, by the "unreliable spirits" he communes with, we commend them to him, but let him not forget that there is One greater than Job who asks the question, "If they believe not Moses and the prophets, neither will they be persuaded though one rose from the dead."

The testimony of Mr. J. Murray Spear is so much like what is heard daily in the wards of hospitals for the insane, that, had the

communication been handed to us in MS. by a patient at the morning visit, we should have preserved it and read it with interest, as bearing on his mental condition. Mr. Spear was a "healing medium," and could at once cure people who had been struck by lightning. One lady was so cured of all pain from the thunder-bolt in a very short time. And Mr. Spear, in going about healing all manner of diseases, travelled, he says, "many hundred thousand miles, having been sent into twenty of the thirty-six States of America, besides crossing the Atlantic three times, visiting England, Scotland, and Wales, and having been repeatedly sent to the Continent." So great was his power, he states to the committee, that, by merely pointing to the sick, without touching them, all their pain would be driven away, and they would sink into a sound sleep.

The next witness examined before the committee was Mr. Benjamin Coleman, and we are here tempted to bring forward his extraordinary experience with the accordion, and the spirits of two aunts, who died before he was born; and who, it would seem, must have learned their skill in playing this instrument in the spirit-land. The whole account is so rich that we give it entire: "A new accordion, which had been bought that day, was lying upon the table before Mr. Home, and he asked the spirits if they would play upon it. The answer by three raps was 'yes.' He then pulled it out to its full tension, and taking hold of the blank end, rested his hand upon his knee below the surface of the table, and placed his left hand upon the table, which (together with the hands of all present) was visible. There was a bright gas-light above our heads. I then asked the spirits to play an air for me, and selected 'Home, Sweet Home,' which was instantly played upon the accordion in the most beautiful style imaginable." Mr. Coleman then asked Mr. Home if he thought the instrument would play in his (Mr. Coleman's) hand. Mr. Home asked the spirits, "Will you play for Mr. Coleman?" The reply by three *decided* raps was "yes." "I then," says Mr. Coleman, "arose from my seat to take the accordion, but Mr. Home told me to remain seated, and said he would ask the spirits to bring it to me. He shortly afterward said, 'They have taken it from me.' He then placed his *right* hand upon the table. In a minute or so the accordion was pressed against my knee; I pushed my chair back to make room for it, when the accordion steadily rose up above the table, and I took it in my hand. I then did as Mr. Home had done, rested it on my knee, requesting that it would play for me 'Angels ever Bright and Fair.' Immediately I felt that it was strongly tugged, and, after being successively elongated and

compressed, the required melody flowed forth, *with variations*, while the instrument remained in my hand. . . . Once," Mr. Coleman states, "at a sitting with Mr. Home, a table was elevated to the ceiling and lowered again without noise, as lightly as if it had been a snow-flake. A bell was then placed upon the table, and a hand and arm of feminine proportions were seen to rise from beneath the blank side of the table, and which, reaching toward the bell, took it up, rung it, and carried it from our sight. In an instant afterward I felt a hand patting my knee. I put my hand down, received the bell and placed it on the table. I then asked to be allowed to feel the hand; and, putting my own hand open beneath the table, I felt a soft feminine hand placed in my own, which was again slowly withdrawn. It was of velvety softness, neither warm nor cold. The arm was draped, as we all of us saw and remarked upon, in a gauze-like sleeve, through which the full form of the arm was distinctly visible. Three or four of the party had rings on their fingers, which they soon discovered had been removed. Instantly a hand presented itself, exhibiting the four rings on its fingers, and then inverting itself, the rings were scattered upon the table." Upon one occasion, when the violent movements of a table had thrown all the ladies present into hysterical convulsions, Mr. Coleman proceeded to exorcise the devil which seemed to have taken possession of them. Matters had proceeded so far that Mr. Coleman, feeling that it was necessary to take a decided stand and command the dancing tables to be still, said: "Now, spirits, you have done quite enough. I command you to leave this place in God's name!" He says they appeared to obey his injunction, for nothing further took place.

Mr. Jones, a spiritualist, gave evidence before the committee touching many things, and among them the extraordinary performances of *his* accordion. Why this instrument, of all others, the most harassing to delicate mortal ears, if we except the bagpipes or hurdy-gurdy, should be so great a favorite in spirit-land, we are unable to say; certainly, if the spirits of Mozart and Mendelssohn are there with their earthly ears, they must be in greater torment than Dives. We are of the opinion, however, that the spirits most congenial to Mr. Jones and his family were such as "My Landlady's Daughter," so graphically described by Dr. Holmes—"she who did a little fancy-work, said 'yees,' and playcd the accordion, while her mamma made the pud-dings." But, to come to Mr. Jones's accordion: it commenced and continued playing that air, so well known to teetotallers, "Taste not the Cup," and the family, knowing the air and the words, chimed in. While they were wondering why such a song should be played, Arthur,

a hopeful son of Mr. Jones, said : " It is in answer to my mental question, ' Shall I give up teetotalism and do as others ? ' " After this advice I will not take the cup." " God bless you all ! " said the sounds at last ; and the amiable and pious Jones family all responded " Amen !—may God bless *you* ! " Then a jubilant gush of sound came on the table, and all ceased. The pious family then sang, " Praise God from whom all blessings flow," and the sitting closed. We would not like to speak disparagingly of this good, simple Jones family ; but, we must say, if they would take to their catechism, hymn-books, and books of temperance-songs, and cease to dabble in spiritualism, or seek to elucidate some of the deepest and least understood phenomena in physical and psychological science—phenomena that even the deepest thinkers and most earnest investigators do not as yet feel confident to grapple with—it would be well. But fools will " rush in where angels fear to tread."

This will be further illustrated by what follows, relating to spirit-drawings. It is taken from the minutes of a *séance* held at the house of Mrs. Guppy. The first message that was given was this : " You must undergo a process of purification before I can draw. I will draw the emblem of spiritualism." Mrs. Guppy and her friends were then lavishly sprinkled with perfume, after which they were all desired to sing. Pens and ink were then demanded, and a drawing of a dove was executed, hovering over the world, and holding in its claws a palm-leaf and an olive-branch, while rays flow down from it, as if to enlighten the world. This was certainly not an uncommon illustration. A message was then given as follows : " This *séance* is the first of a series of illustrations of passing through death into life. I will try to solve and explain by drawing the poetry of spirit-life." At the next sitting they were told by the " raps " to read " Dying Christian to his Soul." The question then arose, where they were to obtain a copy of Pope's poems. It was suggested that it be brought up from the third floor below, but the spirits forbade them, and placed a volume in the hand of one of the persons present at the *séance*, with a corner of the page turned down at the poem. One proceeded to read, as desired, while the spirit-friends proceeded to draw a picture " marvelously illustrative of the poem itself, as it represents the *spirits* rising with rapture in *its* eyes, from the earthly body now discarded, as having been rendered useless by death." The reader will, doubtless, observe here a little disagreement between the noun and pronoun, in number and person, but grammatical accuracy is not always deemed necessary, we have observed, in spiritual communications. Whether

this be a fault of the spirits, or mediums, we leave for others to decide; perhaps the early education of both has been somewhat neglected. One thing will be observed by the most obtuse mind, which is, the marked correspondence in the general intellectual and educational status of the mediums and circles, and the spirits with whom they communicate, and no greater thoughts than such as we may suppose could arise in the brains of the circles consulting, are communicated by the spirits consulted. Time, however, will not allow of our bringing forward here any theory respecting these well-marked phenomena, but theories will suggest themselves to the mind of any one who has given the slightest attention to physical and psychological science.

[TO BE CONCLUDED.]

The Sympathetic Nervous System.¹

THE late Dr. John O'Reilly, of this city, actuated by a laudable desire to increase the existing knowledge of the sympathetic nervous system, devised the sum of five hundred dollars, to be awarded by the Academy of Medicine to the author of the best essay upon the physiology and pathology of that very important part of the animal organism. A committee was appointed by the Academy, and the prize was adjudged to the writer of the essay before us. By the terms of the bequest, the committee had no option but to decide which of the memoirs submitted was the best, and thus, though all might be bad, the one that was least unworthy would receive the distinction of being raised to a kind of left-handed preëminence above its competitors. From what we know of the members of the committee, we feel very sure that, had they been at liberty to report that, in their opinion, none of the essays were of sufficient excellence to receive the award, Dr. Edes would have been at liberty to publish his dissertation, on his own responsibility, and without the implied approval of the New York Academy of Medicine. Written in bad English, a mere collection of the observations of others, heterogeneously thrown together, unmarked by original researches, and thus consisting of a kind of literary hodge-podge, of the most indigestible and innutritious qualities, it is entirely unfit to go out into the world under the auspices of any society pretending to a scientific status. We rise from the wearisome task of its perusal with mingled feelings of joy and compassion—joy,

¹ The Physiology and Pathology of the Sympathetic Nervous System. By Robert T. Edes, M. D.; an Essay to which the O'Reilly Prize was awarded by the New York Academy of Medicine, May 5, 1869. Printed for the Academy.

that we have at length waded through its mass of inelegancies of composition, barrenness of conception, and feebleness of utterance—compassion for the worthy gentlemen who not only, in the discharge of their duty, were obliged to read this production, but perhaps a dozen others still more inelegant, more barren, and more feeble. If they preserved their equanimity and patience under their terrible trials, they are fit to take charge of an asylum for idiots, and may plead the fact hereafter, in mitigation of punishment for all the offences of their mundane existence.

Without intending to tire the reader, by calling attention to all the faults of Dr. Edes's essay, we feel bound, after the general statements we have made, to adduce sufficient evidence to show that we have not been reckless in our assertions. And first, as regards the style of composition :

"The contraction of arteries of pia mater was observed by Nothnagel on galvanization of crural nerve" (p. 35).

"The artery can be felt to pulsate much more strongly than when vessels are contracted" (p. 40).

"The cervical nerves also control vessels of ear" (p. 54).

"In a case reported by Waters, a man was struck on left side of head by capstan-bar" (p. 97).

There is scarcely a page which does not contain one or more instances such as the above, of Dr. Edes's antipathy to the definite and indefinite articles.

Obscurity of statement is well illustrated in the following examples, taken at random from many :

"This has been shown by direct galvanization, and galvanization of sympathetic" (p. 26).

In what respect "direct galvanization" differs from "galvanization," is a mystery which, probably, no one but Dr. Edes can fathom.

"Onimus found the constant current not to produce arrest of heart. When very strong, the heart's beats were much less energetic, but this was due to troubles in respiration" (p. 58).

Here the author probably means to say that Onimus found the constant current incapable of causing an arrest of *the action* of the heart, but how the heart's beats, when strong, can be "less energetic," passes our understanding, even with all the aid to be derived from considering the "troubles in respiration."

"A woman, aged sixty, following grief from loss of friends and violent weeping, felt her eyes suddenly become prominent, and her thyroid pulsate."

The grief due to "loss of friends and violent weeping" is a little "mixed;" but how the woman could follow this grief, excites a train of metaphysical reasoning which is simply bewildering. No wonder she felt her eyes suddenly become prominent, and her thyroid (?) pulsate. But the sequel is to come:

"She died of apoplexy, of which the appropriate lesion was found in brain after death."

We might stop to ask, What is the appropriate lesion of apoplexy? Is it a clot, or an effusion of serum, or a tumor? But we must hurry on:

"There was hypertrophy of heart and atheroma, commencing cirrhosis" (p. 133).

Here we must stop. Metaphysics will no longer help us, and we leave this last paragraph to future commentators, frankly confessing that we have no idea of its significance.

Accuracy of quotation is necessary in all writers, and especially in those claiming to be scientific. One or two examples will suffice to show Dr. Edes's slipshod way of dealing with the authors he cites:

"A patient cut the inner side of the index-finger deeply; and after wound had healed, the distal part of finger was 2° hotter than the corresponding part of middle" (p. 96).

This statement is said by Dr. Edes to be made by Dr. Handfield Jones. *Clin. Obs. on Funct. Nerv. Dis.*, p. 29.

On referring to this source, we find Dr. Jones's language to be as follows:

"A patient of my own cut the inner side of the index-finger deeply; and after the wound had quite healed, I found the distal part of that finger 2° hotter than the corresponding part of the middle."

The words printed in italics are those which Dr. Edes, in pretending to quote an author correctly, has seen fit to leave out.

Erichsen is likewise made, through the medium of Dr. Edes, to write in bad English:

"A complete paralysis of sensation and motion, of all parts below this, was the result" (p. 103).

Erichsen says:

"A complete paralysis of sensation and motion of all the parts below this was the immediate result."

Dr. Edes's reference is *Railway and Other Injuries of the Nervous System* (p. 33). On referring to the volume, no such case occurs on page 33, but it was finally found on page 27, and is quoted by Erichsen from two American publications, "Eves's Surgical Cases," and

the *New York Journal of Medicine*. Dr. Edes, as is usual with him, does not give in his references the place or date of publication. He probably quoted from the American reprint of Erichsen, but if he did, he ought to have so stated. Why he should have quoted the case at all from Erichsen, when he might readily have obtained it from the original sources, is not clear.

A quotation from Paget is also incorrectly given (p. 120), and is referred, without stating the edition, to his "Surgical Pathology," p. 44. Examination of the last English edition shows that the remarks in question are on page 32.

At page 125 Dr. Edes begins the translation of a quotation from Bernard's "*Système Nerveux*," and, without any indication of doing so, omits a very considerable portion of it. Thus quotes Dr. Edes:

"Generally at the end of two days the cornea begins to become opaque. At the end of some days the opacity of the cornea becomes more and more pronounced," etc.

Bernard writes:

"Généralment, au bout de deux jours, la cornée commence à devenir opaque. Plus tard, l'animal devient aveugle." And then there are fifteen lines more before the paragraph beginning "au bout de quelques jours," etc.

Romberg also comes in for his share of misquotation. The reference is to "Nervous Diseases," vol. i., p. 216. Presuming that under this disguised title the Sydenham translation of the "*Lehrbuch der Nervenkrankheiten*" was before Dr. Edes, we consulted the volume and page cited. The subject is on page 217, but that is a small matter. Dr. Edes quotes: "After death the origin of trigeminus was found to be yellow, softened, atrophic, and deprived of its white matter. The ganglion Gasserii was much enlarged, and presented the appearance and consistency of bacon. The first branch of fifth and its ramifications were reddened as if congested. Right optic nerve before the chiasma was only a quarter the size of the left one."

In the translation which Dr. Edes pretends to quote correctly the language is:

"After death the origin of the trigeminus was found to be yellow, softened, atrophic, and deprived of its white matter. The ganglion Casseri was much enlarged, and presented the appearance and consistency of bacon. *The nerve-fibres, which are generally traceable through the ganglion, were entirely fused with it.* The first branch of the fifth and its ramifications were reddened as if congested, and adhered closely to the tendinous sheath within the orbit. The inferior

maxillary branch appeared normal after its issue from the maxillary foramen. The superior maxillary was most altered, being thickened, tough, and steatomatous like the ganglion; several of its fibres had increased considerably in bulk. The right optic nerve before the chiasma was only the quarter the size of the left one; it was softened, etc.

Dr. Edes certainly cannot know the power of quotation-marks. For not only does he omit important parts of Romberg's language, while giving the impression that he is citing it entire, but he goes so far as to change Casseri into Gasserii. To be sure, the semilunar ganglion is named after Gasser, and not Casser; but though Dr. Edes has a perfect right to correct Romberg, he has no right to make Romberg correct himself by quoting him erroneously.

To follow Dr. Edes through all the statements of fact and theory made in his essay would involve the writing of a dissertation on the sympathetic nerve, as studied by physiologists, with more enterprise than he appears to possess. There are, however, a few original remarks which may be cited as specimens of Dr. Edes's own contributions to the science of the subject:

"It would be interesting for the transcendental anatomist," says Dr. Edes, "to show the relation between the hair-bulbs thrust outward by the arrectores (?) pili and that magnified and highly-developed hair-bulb, the eyeball, protruded by its fibro-muscular sheath" (p. 26).

Oken has imagined some very extravagant analogies, but he would probably have opened his eyes to their widest extent at the idea of having his visual organs compared to hair-bulbs.

Dr. Edes regards (p. 13) the sympathetic as a cerebro-spinal nerve, a view which is entirely unwarranted, whether its anatomy, physiology, or pathology, be considered.

As a specimen of Dr. Edes's pathology, the assertion that "mesenteric neuralgia is colic" (p. 86) may be adduced. It would be fully as correct to say "rheumatism is gout."

On page 21 we are told that "there is no nerve whose section paralyzes the pupil or renders it immovable, either in dilatation or contraction;" while on page 24 we meet with the statement that "section of all the ciliary nerves renders the pupil immovable, being in the dog dilated, in the rabbit contracted." We admit that Dr. Edes may logically plead that there is no contradiction here, and that, grammatically, *being* refers to *section*, and not to *the pupil*. A dilated or contracted section would, however, be somewhat of an anomaly.

It is stated (p. 8) that the sympathetic "consists then of the gan-

gion-bearing cord situated on the sides of the vertebral column from the superior cervical ganglion to the ganglion impar." We humbly, with due regard for Dr. Edes's anatomical knowledge, demur to this statement. The sympathetic nerve, as any first-course medical student ought to know, extends a considerable distance above the superior cervical ganglion, and even into the cranium, where it forms several plexuses, and has several ganglia.

Although there is an appearance of research about Dr. Edes's essay, examination shows that his references are mainly to periodicals and books of recent date. Thus we find no mention made of the researches of Tiedemann, Lee, or Killian, relative to the nerves of the uterus, or of those of Luschka or Arnold concerning certain ganglia of the sympathetic, or to Brachet,¹ whose treatise is a model of scientific research, or to Davey,² who has written a work on the sympathetic nerve, to which Dr. Edes's essay bears about the same relation as a tallow-candle does to a calcium-light, or even to Dr. John O'Reilly,³ the founder of the prize for which Dr. Edes submitted his memoir. We can scarcely say that this last-mentioned dereliction is an instance of ingratitude; but if, as has been said, gratitude is "a lively sense of favors to come," Dr. Edes is certainly very near being ungrateful.

In conclusion, we would remind Dr. Edes that style in composition is a subject that he may well study with advantage to himself and the public, if he has any idea of again appearing as an author. Even the most carefully and scientifically conducted researches, if communicated in a vicious mode of expression, fail to attract the attention which they would otherwise command. He is probably young; we are sure he is ambitious; his essay gives evidence that he is intelligent and educated. These are qualities which go far toward insuring a successful career. But he must bear in mind that carelessness, want of thoroughness, and above all deficient originality, are the great failings of young writers of the present day. They rush into print after having consulted a bundle of magazines, and without having been trained in those methods of investigation and habits of research which can alone fit them to appear as authors in science. They are the mere gatherers of the fruits which others have planted, and cul-

¹ *Recherches Experimentales sur les Fonctions du Système Nerveux, Ganglionnaire, etc.*, Paris, 1837.

² *The Ganglionic Nervous System; its Structure, Functions, and Diseases*, London, 1858.

³ "The Nervous and Vascular Connection between the Mother and Fœtus in Utero," New York, 1864.

tivated. Dr. Edes has in him, we think, the elements of a higher vocation than this; but, in order that they may be developed, he must work to better effect than is exhibited in the essay which we have felt it our duty to criticise, severely perhaps, but certainly justly, and with no unkind spirit toward its author.

Eulenburg's Functional Nervous Diseases.

THE author divides his work¹ into neuroses of the apparatus of sensation, and neuroses of the apparatus of motion.

In the first section he treats of the general forms of disturbed sensation. The division of neuroses of sensation as forms of disease and their separation into hyperæsthesiæ and anæsthesiæ, rest on a purely symptomatic basis. To every question, as to what precise anatomical substratum they originate in, the answer is, in the apparatus of sensation. But further investigation shows a want which is being gradually filled by the labors in histology and experimental physiology. Hyperæsthesiæ are symptoms of neuroses of the sensitive apparatus, characterized by irritation, *id est*, where by an excess of irritation the normal proportion of reaction is distorted in the consciousness. Anæsthesiæ are symptoms of neuroses of the apparatus of sensation, characterized by depression by which the resulting reaction of the consciousness is in some way defective, obstructed, or entirely null. The author describes as hyperalgiæ and analgiæ all abnormal reactions of sensibility in the sphere of the nerves of sensation generally—as hyperalgesiæ and analgesiæ, on the other hand, only those where the more powerful reaction called pain occurs in a greater or less degree. Another class, the paræsthesiæ, has been spoken of, but these are true hyperæsthesiæ. Hyperæsthesiæ occur under three essentially different forms, viz., peripheral, central, and transmissional hyperæsthesiæ. Anæsthesiæ may be divided into three similar forms. In these cases the fundamental appearance lies in the different relations of the reflex excitability.

In a physiological analysis of the cutaneous phenomena of sensation, we must distinguish two actions of the sensitive cutaneous nerves: the quality of the sensations, aroused by the source of irritation, and the capacity of local fixation of the irritating cause. Some of these, the sensations of touch, are peculiar to the skin; the others, the general cutaneous sensations, are analogous to the actions of the visceral nerves

¹ *Lehrbuch der Functionellen Nervenkrankheiten auf Physiologischer Basis.* By Dr. Albert Eulenburg, privat doc., an des Univers. Berlin, etc., etc. Berlin, 1871. Hirschwald.

of sensation. Only the sensations of touch are phenomena of special sense—manifestations of a sense of touch.

It is highly probable that the sense of pressure and the sense of temperature are effected by the same organs. All the other forms of cutaneous sensation fall under the rubric of general cutaneous sensations. One difference between these sensations and the sensations of touch consists in that the general cutaneous sensations, especially pain, may be produced by an irritation of any portion of the course of the sensitive nerves, and not solely of their peripheric ends. The author describes an apparatus of his own invention, the baræsthesiometer or measurer of the sense of pressure, as serving well the purpose of measuring the capacity for distinguishing differences of pressure in physiological as well as pathological conditions; and also an apparatus of Goltz, by which artificial waves of variable force are produced, and thereby the minimum is fixed in the form of the weakest pulsations which have just been felt upon the portion of the skin examined. He then describes the modes of testing, and the results of experiments upon the sensations of pressure and heat, and also that of locality or size. The circle of sensation in the latter case is the minimum distance within which two irritations acting simultaneously in different ways upon the skin can be defined by the sensation; the author follows with a table giving the results of a series of experiments upon the sense of localization of different parts of the surface. These show not only a great difference of sensibility in different parts of the surface, but great differences in different persons, and even marked differences in the same person at various times. They also show that practice will educate the surface to greater acuteness of sensibility, and even that, if one half of the body be thus practised upon, the nerves of the corresponding half gain also in acuteness of perception. Duchenne's method of the use of the electric current upon the skin for diagnostic purposes is the most accurate. But Leyden was the first to give accurate formula to the point of essential importance, viz., the fixing of the minimum of sensation of the smallest irritation perceptible at any point of the surface.

Hyperæsthesia and Cutaneous Hyperalgia and Paralgia.—Pathological observations, as well as direct experiments, show that sensibility to pressure, temperature, and localization of the skin, are frequently not simultaneously and proportionally sharpened; in these cases, careful objective examinations only are to be depended on. Excessive reaction of the general sensation, or cutaneous hyperalgæ, are much more frequent. As the excessive reaction to an inadequate

irritation in these cases usually expresses itself in pain, we have the fact announced by hyperalgesia. A slight touch, which, in the normal state, would hardly be felt, is, in this condition, productive of pain, by excessive reaction. Every feeling is accompanied by an element of subjective sensation, or, rather, this sensation lies in the processes of nervous sensation. Pain is only the gradual increase of the sensation which accompanies every sensitive process, or, rather, it is the sensation itself, stripped of the certainty of this contents and the objective phenomena. In hyperalgesia, single portions of the apparatus of sensation have become irritable, consequent upon morbid changes, and all the sensations which are excited by the nerves of these parts are commingled largely with this element of sensation, so that finally all exactness of the sensation is lost apparently in this excess. As to the frequently-mooted question, whether prurigo (Willan) is a nervous or a cutaneous disease, the author says the latter is, neurologically viewed, not a purely sensitive, but a mixed sensitive and vaso-motor neurosis, and presents in this regard, as in the periodicity of its appearance, etc., a relationship to the neuralgiæ, general pathology, and therapeutics. Under the generic term neuralgiæ is collected a group of affections of the nervous apparatus, which show a close relationship in their cardinal symptoms, but whose substantial anatomical causes are still but little defined.

Pain is the pathognomonic symptom of neuralgia. In the spontaneity of neuralgic pain, in its production from internal organic irritation, lies the characteristic difference between neuralgia and hyperæsthesia—rather, neuralgic pain from hyperalgetic; neuralgiæ and hyperalgiæ frequently commingle, however. The great intensity and extent of neuralgic pain has its especial basis in the considerable amount of primitive, sensitive fibres, which, connected in bundles or trunks, or in sensitive central points, are open to simultaneous irritation.

In parenchymatous organs, where the nerve-fibres are in a very small majority to the surrounding mass of the organ, a large extent of disease is necessary to produce extensive pain; but where the central origins of the sensitive nerves, the posterior roots or bundles, or trunks of nerves, are implicated, a very minute focus of disease will cause extensive and intense pain. As to the *points douloureux* of Valleix, they are by no means constant in neuralgia. The author found them in about one-half the cases of neuralgia—in this he confines himself entirely to the sensitive points in the course of a neuralgic nerve only. Romberg has recently shown that these points of pain reveal themselves frequently upon alight, rather than heavy pressure. Lender, the au-

thor thinks, goes entirely too far in ascribing to all neuralgiæ, whether superficial or deep, the presence of a point of pain, and with the latter, a local subcutaneous focus of disease, and in regarding this as the essential and primitive cause in all cases of neuralgia. The *points douloureux* do not necessitate a local *foyer* of disease at the point itself, but only that such disease must be present, either at the point of pressure, or toward the centre from the same, in the course of the affected nerves. As to the phenomena of the diffusion and spread of neuralgic pain, this can occur in the isolated transmission capacity of the peripheric tracts, only in the centres where the projections of sensitive fibres, which represent distant and broad zones of peripheric sensibility, lie in the nearest proximity, and, by the anastomosis of their points of insertion, are in immediate connection; the simultaneous occurrence of multiple neuralgiæ, and their alternations and wanderings, are to be explained in the same manner.

As to the general pathology and causes of neuralgia, the author believes that various changes are present in the molecular mechanism of the sensitive nerve-mass, and that this factor is invariably present in different degrees of intensity and extent. Still, a large number of neuralgiæ have a mediate predisposing cause, an anomaly of constitution, at their basis. This view finds support in the effects of hereditary influence, which probably depends upon congenital anomalies grounded in the primary structure of the central nervous system.

The author then proceeds with the pathology of the different forms of neuralgia—anaemia and cachexia—traumatic neuralgia, from interstitial neuritis, or true neuroma. After quoting from a number of writers, on the so-called *tuberculosa dolorosa* (or painful tubercles of William Wood), the author says: "Probably, at least many, if not all, are caused by pseudo-neuromas—in a few cases by true neuromas, seated upon minute sensitive nerve-twigs. As to the frequency of neuralgiæ, of 6,844 cases, 106 were superficial neuralgiæ; of these, 30 were in males and 76 in females, a proportion of about 1 to 2.5. The maximum of cases occurred in the ages of from 30 to 39."

In the diagnosis of neuralgia, the *punctum saliens* lies in the question, Is it a neuralgia or not? and this is not to be sought in the presence or absence of palpable lesions, but solely and alone in the symptoms. A traumatic injury to a sensitive nerve may produce a neuralgia of the injured nerve; it can cause, however, only eccentric pains, which resemble neuralgia neither in intensity, diffusion, nor periodicity. In doubtful cases, where no localized peripheric nor central lesion is to be found, we must find the seat of the focus of disease from

the eccentric diffusion and radiation of the pain, and from the concomitant, and especially motor and vaso-motor trophic functional disorders. This is often very difficult. The eccentric diffusion of the pain is only a negative criterion in the diagnosis of the source of disease.

Neuralgiæ—General Pathology.—The pathognomonic symptom of neuralgia is pain; pain is neuralgic—1. When spontaneous, i. e., when rising from an internal source; 2. When of unusual intensity and extent; and 3. When irregular, paroxysmal, periodical, etc., all of which are more or less empirical designations. In the spontaneity of neuralgic pain, in its causation by internal organic irritation, lie the characteristic differences between neuralgic and hyperæsthetic pain. The neuralgic phenomena force us to the assumption that the primary source of irritation does not lie in the parenchymatous organs, where the terminal nerve-fibres are diffused, but rather in organs which, principally or entirely, are composed of nervous matter. Where the source of disease lies in the parenchymatous organs, where the non-nervous mass far exceeds the nervous fibres in quantity, the extent and intensity of the pain depends upon the extent of the disease, while in the central origins of the sensitive nerves, the posterior roots, or in the sensitive nerves and fibres, a small focus of disease can produce extensive and intense pain. This is important to be kept in mind, since the essential part of the physician's task lies in discovering the morbid source of the neuralgia.

Points douloureux (Valleix), or subcutaneous circumscribed points of sensitiveness to pressure, occur in rather more than one-half the superficial neuralgiæ; but in the balance they evade the most rigorous search. As to local disease being the cause of these *points douloureux*, the author says: "While many in ischias and in neuralgia brachialis owe their origin to a local morbid source, this is not so to the same degree in other neuralgiæ; by far the majority of painful spots in facial and occipital neuralgia are due, probably, to transmissional hyperæsthesiæ. These cases do not necessitate local disease at the painful point, but only that such disease must exist either at that point or centrifugally from the same, in the course of the afflicted nerve. The diffusion of the pain in neuralgia, outside the nerves originally implicated, rests upon an irradiation of the original sensation-phenomena, which can only occur in the centres, where the projections of the sensitive fibres, representing extensive and extended zones of the peripheral sensibility, lie in the closest proximity, and are connected immediately by anastomosis of their insertion-cells. The same holds good for the simultaneous occurrence of multiple neuralgiæ and their alternations and wanderings.

As to the general pathogenesis and etiology of neuralgiæ, we may assume the neuralgic pain is caused by different changes in the molecular mechanism of the sensitive nerve-mass, and that all remote causes finally end in this common factor for all neuralgiæ. As to the nature of these molecular changes, we are generally quite in the dark. But the assumption gains ground that there is a predisposing cause in a large number of neuralgiæ, and many may be classed as constitutional neuropathics. This view is supported by the well-recognized influence of hereditary taint, and the hereditary occurrences; the coincidences and alternations, probably, are referable to congenital anomalies lying in the primary construction of the central nervous apparatus. Anæmia and cachexia are at all ages predisposing causes. Traumatic injuries of the nerves, by producing interstitial neuritis, and even by the formation of true traumatic neuroma, may be the cause of neuralgia. The author quotes, from many authors, instances of this kind. Enlargements of the bones, and other mechanical causes, may produce neuralgia. Pseudo-neuroma, from traumatic causes, and spontaneous (non-traumatic) neuromas, fibromas, and gliomas, are frequent causes. The tubercula dolorosa (William Wood, 1812) are small, painful subcutaneous tumors, generally not painful on pressure, which are often the origin of neuralgic, and at times of even epileptiform symptoms. Authorities differ as to their source. The author says: "Many if not all of these tubercula are caused by pseudo-neuromas, at times true neuromas, seated upon minute nerves of the skin." Atmospheric influences, rheumatism, syphilis, poisons, such as lead, are among the other causes of neuralgia. As to its frequency at various ages, and in the two sexes, of 6,844 cases, of which 106 were superficial neuralgiæ, 30 were in males and 76 in females—about 1 to 2.5. Some forms, however, are more frequent in males. Of these 106 neuralgiæ, those of the nervi trigemini were the most frequent (29); next neuralgia intercostalis (27); and next in frequency, hemicrania (15).

In the diagnosis of neuralgia, the punctum saliens for the solving of the question, Is it a neuralgia or no? is not, as many suppose, in the presence or absence of palpable lesions, but solely in the symptoms. The same lesion may produce neuralgic and non-neuralgic affections. Neuralgia and neuritis are conceptions which only partially coincide, but partly claim, each for itself, a distinct terrain. It is the same with true and false neuromas, tubercula dolorosa, and generally for all anatomical affections, which more or less coincide with neuralgic symptoms. The license in the use of the term neuralgia for painful affections, in which the cause is obscured or absent, appears to afford

a certain satisfaction to those who desire more a *nomen morbi* than a true diagnosis, and this weakness might be condoned were not therapeutics so markedly and almost unconsciously influenced by the name of a disease. The extension of the pain along the course of a single nerve-trunk is of no exact diagnostic import for the localization of the disease. The motor and vaso-motor trophic symptoms are of great diagnostic importance. The prognosis varies in the highest degree, according to locality, nature of cause, and predominating influences in the system.

In the treatment of neuralgia we are forced in many cases to a purely symptomatic treatment. The author has little confidence in the group of narcotica internally. Hypodermic injections were introduced by Alexander Wood (1855). The author uses principally morphium aceticum, or hydrochloratum in glycerine and water, so that one-sixth to one-fourth grain (0.01 to 0.015) is injected at a time. Next to morphium comes atropiæ sulph. in doses of one-sixtieth to one-twentieth grain (0.001 to 0.003); the valerianate of atropia is not to be preferred. The author goes fully into the consideration of electricity in the treatment of neuralgias. He says: "The action of the constant current is, in a palliative view, often brilliant in results, and in this respect stands second only to the subcutaneous injection of morphium—it is very different as regards the curative results. The anti-neuralgic action of the constant current rests upon a catalytic action which produces a cessation of the morbid irritation."

Compression and cold are used as palliatives in some cases. Compression or ligature of the principal artery—neurotomy and neurectomy—are discussed in full. The author then proceeds to take up the cutaneous neuralgiæ singly: Neuralgia, N. trigemini, prosopalgia, tic-douloureux. Full reference is made to the vaso-motor and vaso-motor trophic disorders met with in many of these cases—redness, swelling, ophthalmia—and to Anstie's case of discoloration of the eyebrow and hair in the vicinity at each neuralgic attack. Also to a case reported in the *Lancet*, of a woman of twenty-six years, who, after repeated severe attacks of supra-orbital neuralgia, had the eyebrows around the foramen supra-orbital dextrum, and a portion of the hair of the head, turn snow-white permanently. The neuralgiæ of the three divisions of the trigemini are discussed in succession, and also *points douloureux*. Neuralgia of the trigeminus is often produced by malaria, but also from many other atmospheric causes. Syphilis is a frequent intracranial cause. The prognosis of the typical neuralgiæ, caused by malaria or other atmospheric influences, is comparatively favorable.

The treatment of neuralgia of the trigeminus, when typical, is to be based on quinine, or quinine with morphia, also subcutaneously injected. Arsenic stands next, the sol. arsenicalis Fowleri, in doses of three to five drops. The author has used atropine hypodermically in three cases: in two with decided palliative effect, in the third general symptoms of poisoning by the drug necessitated its discontinuance. The author has seen remarkable palliative effects from galvanization. He notices the operative procedures of Swan, Trousseau, and a host of others, in division and excision of the nerve, and also the ligation of the carotid. Nussbaum effected a cure in eleven cases, Patruban in seven cases, but this method should be left to the most obstinate cases. He proceeds to the discussion of hemicrania, migraine, and, among others, notes the vaso-motor and pupillary symptoms on the affected side, reported by Dubois-Raymond and Mollendorf's ophthalmoscopic examinations. Compression of the carotid of the affected side at times relieves the pain. The course of migraine is generally protracted, the intervals are often entirely free from pain. The turn of life in women appears to be an exciting cause. Many writers regard migraine as a neuralgia in the region of the first branch of the trigeminus. The author says hemicrania would, therefore, be not simply a neuralgia of the peripheric nerves or of the brain, but an affection of the sympathetic, or a fixed portion of the spinal cord—this view is greatly supported by the enlargement of the pupil on the side affected. The author thinks that in the variations of the arterial flow, and especially in the temporary anæmia of the affected side, a cause is produced which acts as an irritant upon the nerves of the head, and thus produces the paroxysms of pain. The author then takes up in succession and in detail, hemicrania, of which he says, as to its nature, cases probably occur in which not the phenomena of spasm of the vessels, of arterial tetanus in the region of the cervical sympathetic, but rather a relaxation of the vessels, an arterial hyperæmia from lessened activity of the vaso-motor nerves, is the prominent cause: neuralgia occipitalis, neuralgia intercostalis, neuralgia plexus lumbalis, and neuralgia plexus ischiadici. He gives an extensive description of the different forms of each, their causes, prognosis, and treatment. In all these neuralgiæ of the surface, the author's main-stay seems to be the hypodermic injection of morphia, to which is added such general treatment or special measures as the causes, local or general, may indicate. He also uses, in many cases, the constant electrical current; he appears to have little confidence in the long list of narcotic remedies which have been proposed for neuralgia, either internally or in the form of salves or

ointments. Hypodermic injections and electricity play the principal rôles in the treatment of all these forms of neuralgia. He says the treatment of ischias with the constant current is one of the most encouraging results of galvano-therapeutics; this he usually combines with hypodermic injections of morphia.

Under the head of Visceral Neuralgiæ, he discusses: 1. Angina pectoris. He says: "I coincide with those authors who regard angina pectoris not as a pure hyperæsthesia of the plexus cardiacus, but also as a motor disorder of the cardiac nerves." He cites ossification of the coronary arteries and various heart-diseases; for example, aortic insufficiency and stenosis ostium aorticum, and also fatty degeneration. The difficulties are great in fixing the innervation of the heart, and the cardiac nerves are so variously interwoven, and proceed from so many sources, that isolated disease or functional disorder of the vagus or sympathetic branches of the cardiac plexus can hardly be assumed. As to the causes of the motor disorders in the heart's action, we may define them as disorders of the automatic, regulatory, and sympathetic cardiac nervous system. The probable part taken by the sympathetic and vagus branches in this affection is extensively discussed by the author. As to the treatment, he says: "In a proper use of the constant current lies probably our principal remedy, perhaps the only direct means in the treatment of angina pectoris."

Under the title Neuralgia Gastrica, the author includes gastrodynia neuralgica (or cardialgia) and neuralgia cœliaca. All phenomena of neuralgia gastrica may be referred physiologically to the vagus as the sensitive nerve of the stomach. Thus far we have no proof that sensitive and reflex nerves of the stomach proceed from the solar plexus. The causes of this form of neuralgia are obscure. In the treatment where no causal indications are apparent, the author believes that the employment of the hypodermic injection of morphine is the best and most effective remedy. Neuralgia mesenterica, of which lead-colic is the prototype, is as little a pure hyperæsthesia of the mesenteric plexus as is angina pectoris a hyperæsthesia of the cardiac plexus; it is probably a mixed motor-sensitive neurosis. In the treatment it is a peculiar fact, in which the best observers agree (Stokes, Von Bamberger, Von Niemeyer, etc.), that in lead-colic we have no better symptomatic remedy against the obstinate constipation than the free use of the otherwise constipating narcotic, opium. In these cases also the author has found the best results from hypodermic injections. The author gives likewise a brief space to neuralgia hypogastrica and neuralgia spermatica. Our author devotes a full chapter to cutaneous

anæsthesiæ, which he characterizes as depressed or extinguished function of the cutaneous nerves of sensation. He remarks: "It is a mistake to regard the phenomena of disorders of the circulation and nutrition as dependent on, or caused by, these anæsthesiæ." He regrets that cases of this nature are not more generally examined minutely, as thus many forms of partial disorders of sensation are overlooked. After a full description of the different forms of cutaneous anæsthesiæ, as to treatment, the author says: "In the purely symptomatic character of these affections, and in the immense variety of their causes, it would be useless to give a series of remedies." We can here only regard those means indicated by the symptoms as such. Those anæsthesiæ produced by local disturbances in the circulation—pseudo-neuromas, disease of the bones, compression from neighboring tumors, idiopathic neuritis—are susceptible of treatment as regards their cause. The most common, if not the most effective, remedies are irritating inunctions; in these cases the friction itself is probably as valuable as any medicinal influence exerted by the remedy applied—galvanization of the skin. Hot applications, and, finally, cold baths and douches, have proved useful—visceral paralgæ and hyperalgia. It is here the question of sensations, which depend partly upon the action of abnormal organic irritations upon the visceral nerves of sensation, partly upon an excessive irritability of the latter. Under this head the author enumerates the titillation of the peripheric ends of the nerves of the throat and air-passages, globus, pyrosis, morbid appetite, disordered appetite, polydipsia, etc. The treatment is to be directed to the cause if possible. Electricity and cold water are of benefit at times, symptomatically.

Visceral Anæsthesiæ.—Under this head the author includes anæsthesiæ in the region of the laryngeal and bronchial branches of the vagus, and of its gastric branches. He ends this portion of his treatise by some remarks upon the physiological action of the sensitive muscular nerves and the modes of testing general muscular sensation.

We possess general muscular sensations and a true muscular sense. The author goes on to define the modes of testing this muscular sense by electricity and pressure; and concludes with some remarks on hyperæsthesiæ of the muscles, and muscular anæsthesiæ. He then proceeds to the neuroses of the nerves of taste. The anæsthesiæ of the nerves of taste present an unusual interest, in a diagnostic point of view, as symptoms of disorders of transmission in the provinces of those cerebral nerves, the glosso-pharyngeus, trigeminus, and facialis.

Neuroses of the Olfactorius.—Under this head the author mentions

hyperæsthesiæ olfactoria as occurring in hysteria, some cases of mental derangement, and cerebral diseases, hallucinations of smell, anæsthesia as occurring in paralytic dementia, and in hysteria, neuroses of the opticus, interocular neuritis, intraocular atrophy, embolism of the arteria centralis retinæ. The diseased conditions apparent ophthalmoscopically during life, in the intraocular portion of the optic nerve, may be summed up in hyperæsthesia and anæsthesia optica.

Neuroses of the Acusticus.—The author describes briefly Brenner's method of galvanic examination of the normal acoustic nerve. ("Untersuchungen ü. Beobachtungen über d. Gehörorgan," etc. Leipsic, 1868.) The author describes hyperæsthesia acustica and anæsthesia acustica, and gives some details and tables on the galvanic exploration, and remarks upon the electric treatment.

The second division of the work relates to neuroses of the apparatus of motion. Laming (Akinesis) may be defined as nervous immobility, or suspension or lessening of the motor innervation of the muscular organs. Suspension of the motor innervation produces immobility indeed, but is not the sole and exclusive factor.

Laming of the apparatus of motion may occur through a suspension of the central voluntary excitations, with integrity of functional capacity of the motor conducting apparatus; these may be called central paralysis. Secondly, paralysis may occur with continued voluntary excitations, through suspended conducting capacity in the motor nerve-tracts. According as we have a complete or incomplete suspension of the motor innervation; we have paralysis or paresis. Speaking of our modes of ascertaining the amount of motive laming, our author says: "It is certain that the neuro-muscular excitability, at any rate in response to the means of testing at our command, may be altered in the highest degree, greatly depressed, or even entirely extinguished, without complete or incomplete laming (paralysis or paresis) being necessarily present."

Peripheral paralysis or paresis may be produced by traumatic injuries by compression, by primary changes in the texture of the peripheral nerves. Spinal paralysis suggests in the first place the question, What portions of the spinal cord are capable of producing paralysis by their functional inaction; and, secondly, what diseased processes are capable of producing such functional inaction of those portions? The author then dips into the physiology of the spinal cord. For the general pathogenesis of spinal paralysis results show that interruption of motor conduction may follow:

1. In the cross anterior root-fibres from their entrance into the

cord, to their insertion into the large ganglionic cells of the anterior crura.

2. In the anterior ganglionic cells of the gray matter; also in the anastomoses formed by the various groups of cells with each other.

3. In the longitudinal ascending processes of these cells which continue as medullary fibres within the anterior and lateral columns.

As to the second question, such motor disorder can only be the result of processes which vitiate either the anterior or lateral columns, or the gray substance, especially in its anterior half. In many cases the lesion of these portions of the cord is the secondary consequence of affections of the osseous or soft envelopes of the canal, in others it is caused by primary disease of the cord.

The author proceeds to take up in detail the extension of the disease to the different muscles, to the heart and vessels, and to the abdominal viscera.

Cerebral Paralysis.—As in the spinal cord, the primary cause of disease may lie, not in the substance of the brain, but in its envelopes. The author cites the various cerebral changes of structure which may cause paralysis, the vascular disorders, abscesses, tumors, etc.

Under the head of ischæmic, anæmic, and toxic lamings, the author cites in detail the experiments of many writers upon the cerebral circulation, and its influence in producing paralysis; and, further, the effects of lead, phosphorus, sulphur, mercury, carbonic acid, opium and morphine, curara, ergot in *lathyrus sativus*, saponin, camphor, alcohol, and prussic acid.

As regards functional, reflex, neurolytic lamings, the author quotes from a number of writers who have employed these different designations. He discusses the opposed theories of reflex paralysis of Brown-Séquard and of Jaccoud, those of Leroy and of Lewisson. The consideration of reflex paralysis as a distinct group is entirely justified, only the expression of its production should read that, in certain diseases of internal organs, which occur with powerful irritation of the nerves of sensation, an interruption in the action of the motor-nerve centres may result. He continues by an enumeration of the different diseases which may be followed by motor derangements: exanthematous fevers, erysipelas, variola, typhus fever, cholera, dysentery, diphtheria, gout, rheumatism, syphilis, tuberculosis, and pellagra. As regards the treatment of paralysis, the author enumerates the remedial measures fitted for each variety of cause. He speaks well of the hypodermic injection of strychnine, and the use of the thermal waters. Electricity is to-day the most important, most gen-

eral, and the most useful of the anti-paralytic remedies. As to its mode of action, the author says: "We now know that a muscle atrophies, not merely because it is paralyzed and therefore inactive, but also from especial causes independent of the paralysis as such—principally because its trophic innervation is lessened or extinguished." The centripetal effects of the current, to which Remak has called attention, are characterized by certain phenomena, which, however, are observed only under pathological conditions.

Of these are especially the galvanotonic reflex contractions, to which Remak ascribed great importance in the treatment of central paralysis (apoplexy of the brain and cord). To these tonic reflex movements and central alternatives may be added the diplegic contractions subsequently described by Remak, which, according to him, can occur only through irritation of the sympathetic ganglia, and to which also he ascribes a decided therapeutic value, especially an increase of volume of the atrophied muscles. Of special importance, for the comprehension of the anti-paralytic action, are the modifications of excitability in exhausted nerves and muscles—the "refreshing action" of Haidenhain. The exhausted power of a muscle can be restored by passing through it for a long time the constant current, in which the ascending current proves more effective than the descending. The author regards it as essential in all these cases of paralysis, that the electrical treatment should be commenced with a very gentle and gradual strength of current. He says: "I have observed repeated cases of paralysis, peripheric, traumatic, rheumatic, and saturnine, in which the faradaic contractility was depressed or extinguished, and the galvanic muscular irritability was intact, or even abnormally increased, and which, notwithstanding, were benefited by an exclusively faradaic treatment; frequently the combined alternating employment of peripheric faradization and galvanization is effective, or the central galvanization is combined with peripheric faradization." The author, in his remarks on the gymnastic treatment of paralysis, refers to a new system, conceived by Ling, of Stockholm. Ling had the fortunate idea of introducing a new system of movements—the "duplicate movements." By means of these, one is in a condition to call into isolated play the most of the voluntary muscles, with complete exclusion of the simultaneous action of the antagonistic muscles. The employment of this duplicate movement is naturally confined to the complete paralysis of a muscle. He proceeds to detail the cases in which passive movements are of benefit.

The author then proceeds to the special pathology and treatment of individual forms of paralysis, viz.: paralysis of *nervi oculomotorius*,

trochlearis, and abducens. These forms bear a close resemblance as to cause, prognosis, and treatment. Local electrization is the principal remedial measure. He follows with the paralysis of *nervi facialis*, of the plexus pharyngeus, and oesophagus, of the *rami laryngei*, *nervi hypoglossi*, *glosso-pharyngo-labialis*. Here also electricity furnishes the main source of treatment. Paralysis of the trunk and lower extremities follows in detail. Paralysis *ascendens acuta* is a form of paralysis first noticed by Landry (1859), characterized by a progressive paralysis from the lower to the upper portions of the body, by a very acute and fatal course, and by an absence of *post-mortem* appearances. Later observers, however, have discovered in these cases acute and extensive changes in the spinal cord—the paralysis *essentialis infantilis*. In the paralytic deformities of infants, many factors may combine the intrinsic weight of the paralyzed parts, the arrangement of the soft parts around the joints, the influence of the weight of the body.

If, in consequence of material morbid process, the irritability of any of the sections of the nervous apparatus is decidedly and continually altered, naturally the proportion between the amount of irritation and the amount of innervation in the nervous passages affected ceases. Hence results a disproportion between the amount of irritation and the reaction thereby aroused, the consequent movement; and there is, in fact, either a plus of reaction compared with the irritation, or a minus of reaction—either *hyperkinesis* or *akinesia*. *Hyperkineses* are, therefore, symptoms of the apparatus of motion with an irritative character, i. e., by which, the irritation being excessive, the motor reactions exceeding the normal proportions are generated. *Akineses* are symptoms of neurosis of the motor apparatus, characterized by depression; i. e., in which the reactions upon the irritation are in any way defective. Hence, in *hyperkineses* we may have excessive reaction as well upon the conscious irritation of the will as upon reflex irritations, and the automatic motive irritation—the various forms of spasmodic neuroses.

Pflüger's laws of the symmetrical condition for one-sided reflex action, the law of reflex symmetry, of intersensitive motor movement, and reflex irradiation, undoubtedly hold good also for the pathological reflex phenomena in man.

In the same manner that the author supplemented his view of the *hyperalgia* by the *paralgia*, so he completes his view of the phenomena of motor irritation by the *parakinesis*. Under this term he comprehends abnormal motor reactions which do not result from in-

creased irritability, but rather through the influence of abnormal pathological irritations upon single portions of the motor apparatus.

To the substance of the medulla oblongata must be attributed the function of serving as the foyer of spasms; the central point of departure of general convulsions, the true convulsive centre, is rather in the substance of the pons. As tonic spasms are referred, firstly, certain forms of contraction—and these are classed as paralytic contractions; secondly, those of myopathic origin, that is, from certain changes in the muscles themselves—as rheumatic and syphilitic contractions; and, thirdly, primary neuropathic contractions, dependent upon an increased motor innervation of the muscles. The cerebral contractions are principally represented by the so-called contractions of hemiplegia. It would appear that many of the acquired and the congenital deformities of children were referable to contractions consequent upon primary central affections. The author follows with a brief notice of the spasms of the motor nerves of the eye, which are frequently accompanied by other forms, and may depend on a variety of causes. In spasms of the *nervi laryngei*, the author has found full doses of bromide of potassium useful. In the various forms of spasm, the treatment is principally to be directed to the cause of the affection.

In an appendix, the author concludes his work with a description of *hemitrophia facialis progressiva*, an unusual affection, characterized by a progressive atrophy of one side of the face, first fully described by Romberg. Of the thirteen cases to be found in medical literature, nine occurred in females, and every case occurred before the twenty-fifth year. A primary and striking symptom is a discoloration of the skin, which is followed by a wasting of the flesh. A white spot forms on the face, which gradually spreads; later on, the color becomes yellowish or brownish, like the scar of a burn. The cause of the disease has been assumed to be neuropathic. The deeper portions also take part in the atrophy, muscles, bones, periosteum, lymphatics, etc. Lande recently has denied the neuropathic origin of the disease, and regards it as a primary atrophy of the adipose tissue. The author regards the disease as a neurosis of the region of the trigeminus, and says: "Aside from the observations of Waller, Schiff, Meissner, Brown-Séquard, Samuel, and others, we have already referred to the fact that, in the region of the trigeminus, nerves exist which are in direct connection with the cells, and which most probably effect processes of nutrition in them. Therapeutically, but little can be said."

Balfour Browne's Medical Jurisprudence.

THE most remarkable feature of this volume¹ is its striking resemblance to the well-known work of Dr. Ray on the same subject, of which we had something to say in our last issue. Mr. Browne's book contains nothing, of any consequence whatever, that is not boldly appropriated from other authors, but chiefly from the source we have indicated. Even the arrangement of subjects and the headings of chapters are faithfully copied, and are so far good. The only thing for which the author can claim originality is a style of writing which, we trust, is peculiarly his own. He is very fond of metaphors, odd comparisons, and strange figures of speech, and of asking questions which he does not answer. He seems perpetually exerting himself to say something startling. For instance, he discourses of love in this wise: "The passion which unites the sexes is not a simple feeling, but compounded of many simples, like Jaques's melancholy. The purely physical elements of love are, as it were, its raw material, or rather the foundation-stone of the lofty house love builds and man dwells in. The admiration of personal charms, beauty the more imaginative, and handsomeness the more animal, excellence of human form, grows about the physical feelings as lichens do about rocks." The habit of saying prayers night and morning is spoken of as "religious gymnastics with dumb-bell sins." The author believes in destiny. "Man is like a watch wound up by Fate, to go for a season; he is made for good or evil, by the past; and it is not the present that predetermines the future, but the past that predetermines all time. And what went before the past? was it He who was before time?" His opinion of the High-Church party is not concealed, for he says in the chapter on causes of insanity: "We would not argue that the extreme form of High-Churchism is the most material form of Christian worship, in which symbolism really often loses its soul, and has nothing but the body left—that the constant and all-absorbing exercise of that form of religion, accompanied as it is with much unhealthy self-examination, and a self-bruising asceticism, will not in many cases predispose to insanity." He maintains afterward that the Christian religion, rightly understood, is an excellent thing, and "calculated to predispose to the most perfect mental health." Elsewhere he uses the following language in regard to the recurrence of disease: "We are all proud if we can trace our name back a century or two. Old blood is thought a grand

¹ The Medical Jurisprudence of Insanity. By J. H. Balfour Browne, Esq., of the Middle Temple, Barrister-at-Law. London: J. & A. Churchill, 1871.

thing, but what can trace back its family like disease? When William came over it was with him, but it was here too. It fought on both sides. Where Adam was, it was. Its first ancestor may have been the British cholera, that Adam and his wife had after eating those very unripe apples!" We might go on and give specimens *ad nauseam* of the author's style, but we have quoted enough to show how peculiar it is, and how singularly out of place it appears in a treatise on such a subject as he has chosen.

Unwilling to do injustice to an author whose professional position should enable him to throw some light on the jurisprudence of insanity, we have read again and again certain portions of his writings, where he occasionally attempts to express his own opinions, and are only the more unable to comprehend his meaning. He plunges headlong, on the slightest provocation, into a wilderness of metaphor that is simply ridiculous. There may be humor in his remarks, but it is of the latent kind, and hence he fails as completely to amuse as to instruct. It is so evident to even the casual reader, that Mr. Browne knows nothing worth teaching of psychological medicine, that we need waste no time in demonstration of the fact, though "medical men" come in for a good many sharp rebukes for their incompetency. Borrowers are proverbially ungrateful, and our author is not an exception to the rule. Moreover, he has borrowed only to mar, and the medical profession is certainly under no obligations to him for his rattling and careless compilation.

Mansel's *Metaphysica*.

THIS work¹ is essentially the same as the article "Metaphysics" contributed by the author to the last edition of the *Encyclopædia Britannica*, and is on that account more condensed and concise in some parts than if it had been written as an independent treatise. It gives a clear outline of metaphysics in its most comprehensive sense, and is better for the purposes of the student than a volume encumbered with extravagant speculations or theories, new or old, regarding a subject which, as the author well remarks, "yet has its foundations in some of the deepest needs of human nature, and its superstructure in some of the noblest monuments of human thought."

¹ *Metaphysics, or the Philosophy of Consciousness, Phenomenal and Real*. By Henry Longueville Mansel, B. D., Waynflete Professor of Moral and Metaphysical Philosophy, Fellow of St. John's College, Oxford, Honorary LL. D. of the University of Edinburgh. New York: D. Appleton & Co., 1871.

In attempting to define the term "metaphysics," Mr. Mansel refers to Aristotle, and his division of speculative philosophy into three branches—physics, mathematics, and theology. "Hence it is that while the history of philosophy in its widest sense opens with inquiries identified in their aim with those afterward pursued by the metaphysician, the history of *metaphysics* proper can hardly be said to have commenced until the progress of thought, and the failure of previous speculations, led men to attempt the solution of the general problem of philosophy in a particular manner." The definition of metaphysics given by Aristotle is provisionally accepted—that it is the science which contemplates being as being, and the attributes which belong to it as such. Or, to express more clearly in modern language the problem of metaphysics, as conceived by Plato and Aristotle, its object is "to determine the relation that exists between the subjective necessities of thought and the objective necessities of things." Then follows a brief analysis of the principal subjects treated of in the "Metaphysics" of Aristotle, of whose opinions the author says: "They have a value, historical and philosophical, far beyond their apparent significance to a superficial inspector. They have an historical value, as representing the course of metaphysical inquiry which was pursued, with scarcely an exception, for nearly twenty centuries, and which even now exercises a legitimate influence over the minds of men hardly less extensive than its former absolute dominion. And they have a philosophical value, of which their historical position is the index. However wide may be the gulf that separates the ancient and modern systems of philosophy, they have this at least in common, that both are the produce of human minds, thinking under the same laws, and impelled to speculation by the same irresistible motive of yearnings unsatisfied and doubts unsolved. Each seeks to comply with the requirements of the same nature: each sets out from the ground of that common consciousness which, in intellect no less than in affection, makes the whole world kin." Metaphysics is thus shown to have been used in two different senses, the first dealing with the nature and properties of being or reality, the second with the *faculties, laws, and operations of the human mind*. The study of metaphysics is therefore naturally divisible into two branches, ontology and psychology.

The author treats first of psychology, or the philosophy of the phenomena of consciousness. Consciousness is divided into the intuitive and reflective elements, and the individual is shown to be the ultimate object of all actual consciousness. Then follows a precise definition of what is meant by an individual, as distinct from a general

notion or concept. The consideration of this portion of the subject leads to the question of the origin of language, the mystery of which has its parallel in every other phenomenon of the sensible or intelligible world. After a lucid discussion of intuitive consciousness, the author takes up in order the five senses, the locomotive faculty, muscular sense, the primary and secondary qualities of body, and the acquired perceptions. Two remarkable qualities, which are neither purely bodily nor purely mental, are attention and imagination, especially the former. These subtle qualities, as well as imagination, memory, and hope, are rigidly analyzed and subdivided. After a brief chapter on the classification of internal intuitions, the author proceeds systematically with the passions and emotions, the moral faculty, volition, the consciousness of personality, reflective consciousness, the form, matter, and operations of thought, conception, judgment, reasoning, the association of ideas, and the phenomena of *necessary truths*. The latter are classified under four heads: "I. Logical judgments, in which the predicate is identical with the whole or a part of the attributes comprehended in the subject; as that every triangle must have three angles, that the sums of equal things must be themselves equal, or that all men must be animals. II. Mathematical judgments, which express a necessary relation between two distinct notions concerning quantity, continuous or discrete; as that two straight lines cannot enclose a space, that the angles of every triangle must be equal to two right angles, or that seven and five must make twelve. III. Moral judgments, which state the immutable obligation of certain laws of conduct, whether actually observed in practice or not; as that ingratitude or treachery must at all times and in all persons be worthy of condemnation. IV. Metaphysical judgments, expressing an apparently necessary relation between the known and unknown, between the sensible phenomenon and the supersensible reality; as that every attribute belongs to some substance, and that every change is brought about by some cause." These several classes of judgments are explained at length.

The second part of the treatise is devoted to ontology, or the philosophy of the realities of consciousness, and treats of dogmatic or demonstrative metaphysics and its subdivisions, reviewing the critical philosophy of Kant, and the various systems of Fichte, Schelling, Hegel, and Herbart. The conclusion at which the author arrives is, briefly, that ontology, in its highest sense, becomes identified with psychology. He contents himself with pointing out problems for future metaphysicians, instead of endeavoring to clear up the many

difficulties that present themselves; but he shows clearly enough that many of the problems of ontology ought not to be abandoned as insoluble. On the other hand, he demonstrates that some of the higher problems of cosmology and theology are hopelessly beyond the reach of human faculties, and that, to attempt their solution, can but result in failure. His aim, throughout, is to inculcate "the knowledge of ourselves and of our faculties; of what we may and what we may not hope to accomplish; of the laws and limits of Reason; and, by consequence, of the just claims of Faith."

Tilbury Fox on Skin Diseases.

As a hand-book for diseases of the skin, this work¹ has some decided advantages over any other with which we are acquainted. It combines in a fair proportion the consideration of pathology, diagnosis, and treatment, and is, in all respects, in advance of the majority of English works on dermatology. The student who follows Dr. Fox need not fear that he will have much to unlearn as he advances in his study of skin-diseases under the ablest German masters. The classification is, to some extent, in accordance with the plan proposed by the College of Physicians, but modified by the author to meet his own convictions and the views of eminent Continental observers. It is interesting to note how, after the lapse of many years, the arrangement of Willan is reproduced, and made the basis of the most approved classification of the day. It is scarcely within our province to review Dr. Fox's volume in detail, but we have given it a sufficiently careful perusal to feel justified in recommending it as a valuable guide to both student and practitioner. We turn with much interest to the chapter on Neuroses of the Skin, and find that the author appreciates the importance of nerve-disorder as the origin of a certain class of diseases, in which cause and effect have sometimes been confounded. There is every probability that, with an increased knowledge of nerve-lesions, their part in the pathology of skin-diseases will assume a much greater significance than is at present accorded to it. The affections comprised by the author under the head of neurotic disease are: increased sensibility, or hyperæsthesia; diminished sensibility, or

¹ Skin Diseases: their Description, Pathology, Diagnosis, and Treatment. By Tilbury Fox, M. D., London, M. R. C. P., Physician to the Skin Department of University College Hospital, etc. First American from last London edition. Edited by M. H. Henry, M. D., Surgeon to the New York Dispensary, Department of Venereal Diseases. New York: William Wood & Co., 1871.

anæsthesia; and perverted sensibility, including pruritus and prurigo. The author ridicules the idea that prurigo is of pedicular origin, and is positive in his belief that "the basis of the disease is a paresis, a disorder of the nervous element of the skin—a neurose." In regard to this and all other skin-diseases, the directions laid down for treatment are full, explicit, and rational. The author speaks from a vast clinical experience, and we feel sure that his advice is always practical, rather than experimental or suggestive. There is appended a copious formulary, including the prescriptions by nearly all the leading dermatologists of the day. The author gives a hint, however, in regard to recognizing diseases as described by German writers, that may be applied with equal propriety to the department of therapeutics. He says that some skin-diseases do not possess, in England, the same characteristics that are attributed to them in other countries. This is undoubtedly true. We are of opinion that climatic and geographical conditions influence the character of diseases more than is commonly supposed, so that a perfect description of a given disease, as it appears in Europe, may be quite imperfect as a portrait of the same disease occurring in another quarter of the world. Hence it is that minute directions, as to treatment by foreign authors, must always be taken with some allowances, and modified by the light of our own experience.

The editor of the American edition of the work before us, Dr. M. H. Henry, has endeavored to follow out the suggestions of the author, and has accomplished his task very satisfactorily.

Neumann's Hand-Book of Skin Diseases.

NEUMANN we know of old. The German editions have appeared and received their measure of comment and criticism—which has always been largely made up of praise. The book¹ has acquired the undisputed position of a first rank among the dermatological productions of Germany, representing as it does mainly the views of the German father of dermatology, and based upon the most careful microscopic research.

We have here to do rather with the manner of the translation than with the matter of the German author. Concerning the latter,

¹ "Hand-book of Skin Diseases," by Isidor Neumann, Docent an der k. k. Universität in Wien. Translated from the second German edition, with Notes, by Lucius D. Bulkley, A. M., M. D., etc. Illustrated with Sixty-six Woodcuts. New York: D. Appleton & Co., 1872.

in a general way, umbrage might be justly taken at the chapter on syphilis (especially regarding the description of chancre) and fault found here and there, now for an omission of a fact, now for a broad generalization, which seems unwarrantable, now for handling a subject in what appears to be a one-sided, narrow way; and praise might be freely bestowed for careful pathological investigation, bold clearness of description, many sharp distinctions finely drawn between diseases liable to be confounded, and many excellent points in external treatment; but these comments have been made long ago, and are familiar to dermatologists. Now, it is not with Neumann, the pathological text-book of the specialist, that we have to deal, but with a translation of Neumann, enlarged by notes, and intended to rank as a practical text-book for the student and the general practitioner as well as for the specialist.

Neumann looks well in its new dress, and is ready to perform good service in America. Its publication will probably effect more for American dermatology than has yet been done by any treatise coming out of an American press.

Germany has a reputation preëminent in pathology, and Neumann's book might have been justly styled a pathology of the skin. England and France, on the other hand, have contributed a great deal to dermatology in the way of therapeutics and parasitology—although the latter has become the property of all nations. America stands off and does not seem to originate, but, with good sense and without feeling, she calmly selects what is best from all quarters, tending to adopt the pathology of the Germans, but not to subscribe entirely to their treatment.

Standing in this position, no text-book can be of more value to the American physician than the translation of Neumann. The book is really the pathology of skin-diseases, by Neumann, with general remarks, suggestions, and therapeutics, derived from all sources—a sort of compendium of treatment. The translator asserts the right to an expression of opinion occasionally, with becoming modesty, but mainly reproduces the views of well-recognized authorities. In this way, besides a translation of the text of the original the present volume contains, in a great measure, the cream of the views of most recognized authors—mainly in regard to treatment. Great credit is due to Dr. Bulkley for the simple, brief, and concise manner in which he has expressed in his notes the varying views of the different authors, among whom may be mentioned Anderson, Bazin, Bulkley, Cazenave, Tilbury Fox, Hardy, Hebra (beyond what is given in the text), Hillier, Hunt, Neligan, Rayer, Squire, Thomson, Willan, Wilson, and others.

Another feature in the American edition worthy of praise is the index, which is particularly full and well arranged. The same may be said of the list of synonymes introduced by Bulkley, in connection with each malady, treated in such a way as, with the assistance of the index, to do away with all chance of confusion from the misunderstanding of terms—a trouble which the student always experiences, and which the imperfect nomenclature and variety of classifications tend to perpetuate. If a student knows a given disease by any of the various names with which it may have been from time to time christened, he can find that name in the index, and turn at once to the description of the disease he desires to study, although the latter may be treated of under an entirely different name.

The Appendix contains a good bibliography and an excellent article on vaccination, by Dr. Frank P. Foster, who has become well known as an authority on the question he treats, and who has condensed into three pages a good deal of solid information.

Regarding the style of the book as a whole, the well-known elegant finish of the works coming from the press of D. Appleton & Co. renders comment in this quarter unnecessary. The illustrations seem to be as good as their originals. The style of the translation is very good, containing much of the terseness of the original, rendered in correct English—only here and there do we notice that the book is still German, with English words.

Huxley on Darwin's Critica.

THIS little essay¹ is *not* a criticism of Darwin or his theories, but is levelled at certain of Mr. Darwin's reviewers, especially Mr. Wallace and Mr. Mivart. The latter had declared that Catholic doctrines asserted "derivative creation," or evolution, and that the teachings of the Catholic Church were in harmony with all that modern science could require. In support of this rather startling statement, the authority of Father Suarez is quoted. Mr. Huxley thereupon sought the writings of that celebrated father, and found that they contained a complete contradiction of the very principles they had been brought forward to sustain. The full text is given in the original Latin, so that there may be no question about the interpretation. "If," says Mr. Huxley, "Suarez has rightly stated Catholic doctrine, then is evolution utter heresy, and such I believe it to be. In addition to the truth of the

¹ More Criticisms on Darwin, and Administrative Nihilism. By T. H. Huxley, LL. D., F. R. S., etc. New York: D. Appleton & Co., 1872, pp. 85.

doctrine of evolution, indeed, one of its greatest merits in my eyes is the fact that it occupies a position of complete and irreconcilable antagonism to that vigorous and consistent enemy of the highest intellectual, moral, and social life of mankind—the Catholic Church.” Mr. Huxley then administers the following rebuke to those who will persist in distorting the facts through a well-meant zeal to promote harmony between science and religion: “Elijah’s great question, ‘Will you serve God or Baal? choose ye,’ is uttered audibly enough in the ears of every one of us as we come to manhood. Let every man who tries to answer it seriously, ask himself whether he can be satisfied with the Baal of authority, and with all the good things his worshippers are promised in this world and the next. If he can, let him, if he be so inclined, amuse himself with such scientific implements as authority tells him are safe, and will not cut his fingers; but let him not imagine he is, or can be, both a true son of the Church and a loyal soldier of science.” The arguments of Mr. Wallace, as against certain parts of Darwin’s theories, are shown by Huxley to rest on very slender foundations, and indeed Mr. Darwin is specially fortunate in having so able and fearless a champion, albeit Huxley himself does not entirely agree with the author of “The Descent of Man.”

The paper on Administrative Nihilism is an address delivered to members of the Midland Institute, and is a discussion of the province and authority of government in their bearing on the peace and welfare of the communities governed.

Munsell’s Psychology.

It is no easy task to give, within the limits of a small school-book, a very clear outline of so broad and complex a subject as psychology, yet this is what Prof. Munsell has attempted, for his work¹ is designed especially for the use of teachers. He does not flatter himself, however, he says in the preface, that he has “accomplished the long-sought desideratum of a true positive science of mind, adapted to the wants of humanity in the afternoon of the nineteenth century.” But he ventures to hope that, as the result of sixteen years’ experience as a teacher, he has been able to present the main facts and recognized principles of psychology in such a manner as to render that science a more popular study than heretofore, and to aid in the classification of

¹ Psychology; or, the Science of Mind. By Rev. Oliver S. Munsell, D. D., President of the Illinois Wesleyan University. New York: D. Appleton & Co., 1871.

mental faculties, processes, and products. There is no doubt that much labor has been bestowed on the classification, but we incline to the opinion that it has been overdone, and that the multitude of sections and headings adopted will tend rather to perplex the student than to aid him in forming clear and definite ideas on the subject of mental science. For instance, we find, in addition to divisions and chapters, over one hundred and thirty "sections," and nearly a thousand subdivisions, each requiring a separate head. This excessive division and subdivision may be convenient for the teacher, but we doubt whether it will be practically useful to the student. We regard it as a favorable omen, nevertheless, that there is a demand in our higher schools for text-books on psychology, and, if the one in question is not up to the mark, it will doubtless be followed by others better adapted to the end required.

We are not very favorably impressed with the scientific judgment of the author, since he shows an evident leaning toward the absurdities of spiritualism. He says: "It is neither wise nor safe for Christian psychologists to neglect the phenomena of this strange borderland of dreams, somnambulism, visions, and clairvoyance. Its phenomena, however much they may have been distorted, magnified, and abused, are to some extent real, and are an open door through which we may look in upon the human soul and its mysteries, under conditions which, properly investigated and comprehended, cannot fail to add to our intelligent comprehension of its real nature and capacities." This we regard as a most unwarrantable concession to a class of dreamers, who, so far from adding any thing of value to psychological science, have but encumbered it with a mass of unintelligible rubbish, which must be cleared away and lost sight of by the student who wishes to make any actual progress in psychology. Exception might easily be taken to many other of Prof. Munsell's opinions, but we have said enough to show why we hesitate to recommend his work either to the student or the general reader.

Smith on Wasting Diseases of Infants and Children.

THE publication of the first edition of Dr. Smith's book on the "Wasting Diseases of Infants and Children"¹ was so favorably received,

¹ On the Wasting Diseases of Infants and Children. By Eustace Smith, M. D., London, Member of the Royal College of Physicians; Physician to his Majesty the King of the Belgians, Physician to the Northwest London Free Dispensary for Sick Children, and to the Metropolitan Dispensary. Second American, from the second revised and enlarged English edition. Philadelphia: Henry C. Lea, 1871. 8vo, pp. 266.

both in this country and in England, that he has been induced to prepare a second edition, which has been very much enlarged and improved, not only by the introduction of two entirely new chapters, but also by other valuable additions, besides being thoroughly revised.

The subject of wasting in infancy and childhood is one which has been little understood generally, little studied in particular. How many death-certificates are filled with marasmus as the first or predisposing cause, and with exhaustion as the second or final cause of death, no one knows better than the officers of the Board of Health. Wasting is now known to be merely a symptom and not a disease *per se*; it is a result produced by certain abnormal conditions. Like many other heretofore unexplained phenomena, it has been considered a disease, and treated as such, merely because the causes which gave rise to it were not clearly understood. Appreciating this deficiency, Dr. Smith began a thorough and systematic investigation of the causes which were efficient in exciting this condition, and the result is the present work, in which are to be found some excellent views upon the subject of wasting, which the author seems to have arrived at only after much labor and diligent research. In a highly creditable manner the doctor has explored this important field, and has brought out practically the prominent salient points on the causes, diagnosis, prognosis, pathology, morbid anatomy, and treatment of the disease of childhood, in which wasting is a symptom. The clinical facts thus made applicable give this work a special value. It is a book well worthy of careful perusal, and we would cordially recommend it to those who are interested in the diseases of infancy and childhood.

The Duke of Somerset on Theology and Skepticism.

THE most remarkable thing about this book¹ is, that, being so very small, it should enjoy a title comprehensive enough for a huge volume of ponderous argument. It contains no argument at all, however, and is simply a brief and very well written summary of the conclusions at which a large majority of the thinking world has arrived in regard to the divine claims of Christianity. The Duke of Somerset is at the head of the twelve dukes who compose the queen's Privy Council, and has the two archbishops as fellow-councillors, but he seems nevertheless entirely destitute of reverence for ecclesiastical authorities, and

¹ Christian Theology and Modern Skepticism. By the Duke of Somerset, K. G. New York: D. Appleton & Co., 1872.

predicts the extinction of all forms of dogmatic theology. It is encouraging to find such liberality of thought and freedom of expression in high places.

BIBLIOGRAPHICAL NOTICES.

- I.—*A Hand-Book of Therapeutics*. By SYDNEY RINGER, M. D., Professor of Therapeutics in University College, Physician to University College Hospital (London), etc. New York: William Wood & Co., 1871. 12mo, pp. 483.

PERHAPS the most sensible book on Therapeutics in the English language; free from therapeutical myths and rubbish to a great extent, and exceedingly well adapted to the wants of the student and practitioner.

- II.—*Lectures on the Clinical Uses of Electricity, delivered in University College Hospital*. By J. RUSSELL REYNOLDS, M. D., F. R. S., Professor of the Principles and Practice of Medicine in University College, etc. Philadelphia: Lindsay & Blakiston, 1872. 12mo, pp. 112.

A VERY excellent little book as far as it goes.

- III.—*Medical Thermometry and Human Temperature*. By C. A. WUNDERLICH, Professor of Clinic at the University of Leipsic, etc., etc., and EDWARD SEGUIN, M. D. New York: William Wood & Co., 1871. 12mo, pp. 280.

A USEFUL compendium of the views of Wunderlich, with additional matter by Dr. Seguin. A little book which can be circulated with advantage among those who have not access to the original work.

- IV.—*A Practical Treatise on Bright's Diseases of the Kidneys*. By T. GRAINGER STEWART, M. D., F. R. S. E., etc. Second edition. New York: William Wood & Co., 1871. 8vo, pp. 334.

THE profession is already well acquainted with Dr. Stewart's admirable work. This edition contains additional matter, mainly clinical in character, and is illustrated with two additional plates.

- V.—*Animal and Vegetable Parasites on the Human Skin and Hair*. By B. JOY JEFFRIES, M. D., etc. Boston: Alexander Moore, 1872. 12mo, pp. 102.

- VI.—*Small-Pox, the Predisposing Conditions and their Prevention*. By Dr. CARL BOTH. Boston: Alexander Moore, 1872. 12mo, pp. 50.

VII.—*Three Lectures on the Preservation of Sight.* By DAVID SMITH, M. D., M. R. C. S., etc. London: Robert Hardwicke, 1871. 12mo, pp. 92.

THESE three books are popular manuals, and contain useful information for laymen.

VIII.—*Earth as a Topical Application in Surgery. Being a Full Exposition of its Use in all the Cases requiring Topical Applications admitted in the Men's and Women's Surgical Wards of the Pennsylvania Hospital, during a Period of Six Months, in 1869.* By ADDINELL HEWSON, M. D., one of the Attending-Surgeons to the Pennsylvania Hospital. With four Photo-relief Illustrations. Philadelphia: Lindsay & Blakiston, 1872. 12mo, pp. 309.

A MONOGRAPH on a subject which Dr. Hewson has made peculiarly his own, and which contains an exhaustive account of what may certainly be regarded as a decided advance in surgery.

IX.—*Digitalis; its Mode of Action and its Use. An Inquiry illustrating the Effect of Remedial Agents over Diseased Conditions of the Heart. The Hastings Prize Essay of the British Medical Association for 1870.* By J. MILNER FOTHERGILL, M. D. London, 1871. 12mo, pp. 89.

A VERY thorough and carefully-conducted inquiry relative to the action of a remedy of great importance. Dr. Fothergill's results are briefly stated as follows:

"Under digitalis the pulse becomes steadier, firmer, and less compressible; the excited stroke of palpitation is steadied into the normal quiet, effective contraction; the system is relieved; dyspnoea, the external witness of pulmonary congestion, is abated; the deficient secretion of the urine, which tells us that the pressure on the glomeruli of the Malpighian bodies is lessened, is improved, and free secretion takes its place; dropsy is thus often relieved. The general condition of cyanosis is abated; there is evidence of a better circulation throughout the system generally; frequently the gradually-widening circle of troubles, which are involving the patient's existence, gradually diminishes after an improvement is inaugurated in the circulation. The spell which bound the system in a load of ever-increasing fetters is broken by the administration of a drug whose action is unquestionably to produce better, more complete ventricular contraction; and in that, and that only, I believe the magic lies."

X.—*Zymotic Diseases; their Correlation and Causation.* By A. WOLFF, F. R. C. S., London, 1872. 12mo, pp. 177.

MR. WOLFF denies the specificity of the morbid poisons which give rise to the so-called zymotic diseases. Thus, in his opinion, there are no special entities or peculiar organisms which are capable of propagating special diseases; no typhus-germs, cholera-germs, etc., etc. All zymotic diseases are for him referable to a common cause, and

are all forms of one morbid affection. The cause is decaying organic matter. Mr. Wolff writes forcibly, but we imagine not many hygienists will very soon adopt his views.

XI.—*On the Physiology of Syphilitic Infection.* By FESSENDEN N. OTIS, M. D., Clinical Professor of Venereal Diseases at the College of Physicians and Surgeons, New York, etc., etc. New York: F. Leypoldt, 1872. 8vo, pp. 29.

A VERY philosophical attempt to prove the existence of specific syphilis-germs, and one which the observations of Lorstöfer would appear to confirm in a remarkable manner.

XII.—*Remarks on Strictures of the Urethra of Extreme Calibre, with Cases, and a Description of New Instruments for their Treatment.* By FESSENDEN N. OTIS, M. D., etc. New York: D. Appleton & Co., 1872. 8vo, pp. 25.

AN interesting paper, showing the influence of slight narrowing of the urethra in causing urethral discharge.

XIII.—*Clinical Observations on the Dementia and the Hemiplegia of Syphilis.* By M. M. HENRY, M. D. Surgeon to the New York Dispensary, etc. New York: F. W. Christern, 1872. 8vo, pp. 15.

AN account of two cases of brain-disease apparently due to syphilitic exudations or growths, and which are reported with care by Dr. Henry. Clinical papers like this cannot be too numerous.

XIV.—*Ophthalmoscopic Examination of Sixty Insane Patients in the State Asylum, at Utica.* By HENRY D. NOYES, M. D.

THE importance of ophthalmoscopic examinations in cases of certain diseases of the nervous system has for several years been recognized by Prof. Noyes; indeed, he was among the very first to insist upon the connection between morbid conditions of the fundus of the eye and coexisting intracranial diseases. In this respect he was far in advance of the great majority of ophthalmic surgeons, many of whom, to this day, are ignorant of the relation. The present is an important contribution to the subject.

CHRONICLE.

I.

LETTER FROM GEORGE E. DAY, M. D., F. R. S., LATE PROFESSOR
OF MEDICINE IN THE UNIVERSITY OF ST. ANDREWS.

The Connection between Cranial Injuries and Mental Diseases is discussed by Dr. J. Crichton Browne, in the first volume of "The West Riding Lunatic Asylum Medical Reports," which has just appeared under his able editorship.

He begins by referring to the discrepancy of opinion on this point; some writers maintaining that the skull may be opened and the brain sliced away, with only a temporary inconvenience, while others assert that no injury to the head is so trivial as to be despised. The experience of the officers of the West Riding Asylum supports the latter view, and suggests that the evil consequences, as regards mental health, accruing from violence applied to the head, have not yet been sufficiently realized.

The artificial distortion of the head, wilfully produced by certain American tribes, and apparently not impairing the intelligence, is first discussed, and is shown to have little practical bearing upon the question, because, as it is only the very hardy infants that survive the operation, and as, because (according to Dr. Morton) the various modes of distorting the cranium do not affect the internal capacity, and therefore the size of the brain. In addition to these, there are other reasons of less weight—as that, on the removal of the compression, the brain somewhat recovers its position (old heads being less distorted than young ones); that the skull of these races being comparatively thick, the compression acts more on the osseous than on the nervous system; and that this latter system is much less delicate and susceptible in savage than in civilized races.

No infantile brain among ourselves could tolerate the compression to which the brains of infant Indians are harmlessly subjected; were the experiment tried, death or idiocy would be the certain result.

Although we do not distort our children's heads after they are born, we not unfrequently injure them previously. Dr. Howe, in his "Report on Idiocy in the State of Massachusetts," refers to at least seven cases in which mental weakness was due to attempts on the part of the mothers to procure abortion; and it is not incredible that, carefully guarded as the foetus is *in utero*, such attempts may involve arrest of the cranial development. But, however this may be, it is unquestionable that, at the period of parturition, injuries are often inflicted on the infant's head that afterward show themselves permanently in the nervous system. A trifling disparity between the size of the child's head and of the maternal passages may give rise to the most serious evils, and, where instruments are used, the danger is much aggravated.

The two following cases illustrate the effects of tedious non-instrumental labor, and of the application of the forceps, when they have

crushed the bones of the skull: M. R. was one of a large family of healthy and intelligent children. He was born, after a tedious labor, with a large *caput succedaneum*, testifying to the pressure to which he had been exposed. He was not expected to live; did not cry for some hours after birth; could not suck for several days; had twitchings of the limbs for a fortnight; and then spasms for about three months. He did not walk until he was three years old, and then with a tottering, unsteady gait, and only acquired a few monosyllables a year afterward. Although exceedingly feeble in his mental powers, ineducable, and unable to articulate distinctly, he could still pick up and play upon the piano any tune which he might hear, and manifested some vigor of memory in certain directions. He had a small, conical head, badly-shaped features, and a convergent strabismus, and was at times distressingly dirty and mischievous in his habits.

In G. W. K., aged ten years, and now in the asylum, the head is terribly distorted. He was a first child, born at the full time, but when his mother was somewhat advanced in life; his head was of large size, and delivery could not be effected without the forceps, which were accordingly applied, and by which the parietal bones on both sides were depressed and broken. Immediately after birth the head was noticed to be larger on the left than the right side, and to present a large, rounded eminence in the left coronal region. That shape it has preserved ever since. Soon after birth convulsions came on, and these recurred three or four times a day for twelve months, when they suddenly ceased. He sucked properly, but did not walk until he was two years old, and has never learned to speak. He is now a stout, healthy-looking boy, well formed, except in the head, but thoroughly idiotic. He spends his whole time, when not asleep, in running, without purpose, from place to place, waving his hands rhythmically before him, and uttering loud, harsh, automatic cries from time to time. He cannot feed himself, nor attend to the calls of nature, and only manifests intelligence by recognizing the person who waits upon him, and by imitating the movements of some of his companions in the ward. G. W. K. has a sister three years younger than himself, and born in a normal way, who is a healthy, vivacious child.

If the injuries inflicted by the forceps are less severe than those described above, then imbecility may result. J. V. H., aged thirty-four, a farm-laborer, and now in this asylum, was helped into the world by forceps, and has always been what his father terms "queer-thoughted." He has been always peculiar. As a child he was wilful and passionate, and could not be taught to read. He never had any of the ordinary diseases of childhood, but suffered much from congestion of the eyes, and attacks of giddiness, which were aggravated by any attempt at mental application. At sixteen years of age he had an attack of acute mania, from which he recovered in a few months. Since then he has been childish, unstable, disturbed nightly by terrible dreams, unable to climb to any height without giddiness and an intense feeling of fear, and, at times, irritable and excitable. He is, in short, a good example of that imbecility which is produced by cranial injuries of a minor degree inflicted by the forceps at birth.

Dr. Browne then tells a terrible story of perversion of character, due to distortion produced by the forceps. T. T., the son of wealthy and highly-educated parents, when four years old would always drop his excrement on the floor, or throw it through the window. When six years old he stole toys from shops, and when seven stole money whenever he had a chance. When twelve, he committed numerous robberies, and introduced obscene books and prints into the school to which he had been sent. When thirteen he had connection with a girl of nine, and when fifteen he abandoned himself to drunkenness and immorality, and wrote profane letters to all his friends and acquaintances. His subsequent career was marked by vice of every description, varied by exhibitions of intuitive talent, which enabled him to gain several prizes and distinctions. "His utter incorrigibility under every species of correction; his indifference to all ordinary motives and inducements; his general and progressive eccentricity of manners; his asseverations that he could not by any effort restrain himself; and the contrast which his conduct presented to that of his brothers and sisters, reared in precisely similar circumstances, at length persuaded them that he was the victim of moral insanity, and that his mind and life had been warped by the forceps which had crushed his cranium."

Besides idiocy, imbecility, and moral insanity, Dr. Browne notices a peculiar constitutional tendency to mental or nervous disease, as one of the evils occasionally dependent on injuries inflicted at birth, and gives several illustrative cases.

The danger of even trifling concussions in children is then discussed, and a case is given in which a boy ten years old, of nervous temperament, who, to avoid going daily to school, used to knock his occiput against a wall every day for three weeks, with the view of making himself ill, succeeded so far as to induce squinting, headache, etc., which were followed by an attack of acute dementia, that lasted for several months.

The distinction which prevails between compression of the cranium in children and in adults is subsequently discussed and illustrated. In the former, the inner table does not break so readily as in the latter, and the brain bears pressure better, while the level of the bone is gradually restored without surgical aid, and without permanent impairment of the mental faculties. Cases are quoted of a girl, aged fourteen, who had a depression of the right parietal bone from a blow which rendered her insane for three months, at the end of which time the bone naturally resumed its level, and she recovered; and of a sailor who, when he was aged thirteen, met with a similar but more severe accident, which rendered him insane for thirty-one years, after which he entirely recovered on being trephined.

Slight concussions in adults, if frequently repeated, often give rise to mental disorder. From such causes as these, colliers are generally pretty abundant in the asylums of coal-districts. "J. H.," says Dr. Browne, "carries on his scalp eight entries of coal-dust, of wounds which happened in the pit, and which were thought of no great moment, although two of them were followed by short insensibility,

and one, the last but one, by a little delirium. After the last three accidents, the relations of this man, who was always sober and steady in his habits, noticed a progressive weakness creeping over him. The delirium left him in a state of melancholia, in which he tried to hang himself, and the last *coup*, which followed that attempt in six months, plunged him into a state of fatuity, in which he still continues."

Dr. Browne then notices the condition of the brain in cases of this description. Even when death has been produced by concussion, an examination of the brain and its membranes has failed to reveal any alteration of natural appearances. We are justified, therefore, in concluding that concussion may exert its worst influence without any organic change which is capable of being detected. Every thing points to the conclusion that the evil of concussion really consists in what may be called dynamical changes in the nerve-cells and their connecting fibres. We have reason to know that complete derangement of the mental powers may depend upon modifications in the polar molecules of the nervous element, upon changes in the temperature, chemical composition, or reproduction of the nervous tissues, which, even aided by scientific instruments, we are unequal to discover. So infinitely delicate and complex is the arrangement of the cortical layers that a defect or vice in their actual constitution may exist congenitally, or be induced by circumstances, without ever affording any other evidence of its presence than the disordered phenomena in which it is expressed during life. Such a defect or vice of general or partial distribution is probably produced by the jarring of concussion, and this agency in producing such changes is not without analogy in our physical experience. Wrought-iron, in some inexplicable manner, loses its fibrous and assumes a crystalline character, after undergoing intense or long-continued concussion; and a solution in a state of unstable equilibrium which remains fluid when cooled, even 10° below its freezing-point, suddenly solidifies when any agitation is communicated to it, as by the dropping of a particle of sand upon its surface. These curious phenomena do not, perhaps, throw much light on the *modus operandi* of concussion on the cerebrum, but they illustrate how, without any alteration in the vital properties of the nerve-tissue, a state of change may be set up by any violent agitation or vibration.

In illustration of and in connection with this subject, Dr. Browne enters at some length into the action of slight and continued vibrations on the cerebrum, such as are experienced in railway-travelling in second and third class trains provided with no cushions or padding at the back; and describes, very graphically, the phantasmagoria that floated before the eyes of a gentleman who, in night-travelling in a carriage which jolted abominably, was lying with his head upon a plaid which alone lay between it and the hard seat.

Every practical surgeon, he observes, must have noticed that "in cases of injury of the head there are differences in the whole cause of symptoms produced, which cannot be accounted for by any corresponding difference in the character of the injury. The same lesion, occurring under circumstances exactly similar, will give rise to symptoms in one case slight and in another urgent. This is only explicable by

taking into consideration certain qualifying circumstances which materially modify the effects of cranial injuries, and which we shall briefly allude to under three heads: I. Age. II. Previous condition. III. Locality of the lesion.

I. *Age*.—In addition to what has been already said as to the influence of age, or rather, of youth, in modifying the effects of cranial injuries by virtue of the varying conditions associated with developmental processes, it is only requisite here to advert to a law which has been observed to regulate mental diseases, proceeding from cranial injuries, with great consistency; and that is, that they most frequently tend to assume that special type which is most characteristic of the age of the individual to whom the injury occurs. This may be best explained by a few illustrations briefly summarized:

1. E. B., male, aged twenty, was "dropped" when an infant, had his head hurt, and is now idiotic.

2. M. H., female, aged sixteen, fell off some steps on to the back of her head, a few months ago when cleaning the house, and has had an attack of hysterical mania.

3. A. W., male, aged thirty-five, had a kick from a horse, on the head, and suffered from acute mania.

4. A. M., female, aged forty-six, and at climacteric period, was knocked down by her husband, struck her head, and is recovering from melancholia.

5. M. K., male, aged sixty-five, fell down a stair, was treated for fracture of the base of the skull, and is now a well-marked example of senile dementia.

II. *Previous Condition*.—The bodily and mental state of a person experiencing a cranial injury exercises a considerable influence over the effects subsequently produced, as to their severity and duration. An examination of the patients in the West Riding Asylum, with reference to this subject, seems to justify the following conclusions:

1. That idiots, imbeciles, and chronic lunatics, do not suffer from cranial injuries in an equal degree with persons of average and sound mind.

2. That those who are hereditarily predisposed to insanity suffer more seriously from cranial injuries than those who are exempt from such predisposition.

3. That those who, without hereditary predisposition to insanity, are of intensely nervous diathesis, who are sensitive, excitable, impulsive, and wayward, suffer more seriously from cranial injuries than those who are of more stolid constitution.

4. That those who are in feeble health, or who are debilitated by privation, or are recovering from any acute disease, are more seriously affected by cranial injuries than those who are well nourished and robust.

5. That those who are given to excesses, sexual or alcoholic, suffer more seriously from cranial injuries than those who are abstemious and temperate.

Illustrations of these statements are then given; the two following samples are all that I can find space for:

J. H., aged fifty, from Leeds, after he had suffered from epileptic fits for several years, and from considerable enfeeblement of mind also, when in Canada, in 1857, fell, in a fit, on the corner of an iron stove, and caused a depressed fracture of the frontal bone, of which a considerable portion of bone had to be removed. He felt a great deal better for a time after this accident. The epileptic seizures were less frequent, and the mind was clearer and stronger.

S. K., aged forty-six, from Halifax, has suffered from chronic mania since January, 1867. For eighteen months past she has been in the habit, whenever an opportunity has permitted, of hammering her head upon the table in the most energetic manner. Any one seeing her do this, and hearing the noise of the concussion, would suppose that the skull must be inevitably fractured. The only effect, however, is that the skin on the forehead has been thickened and indurated. She is not at all more fatuous now, nor excited, than she was two years ago.

Further observations upon the variations produced in the mental effects of cranial injuries by the previous condition of the persons sustaining these injuries, and by their localization, must be reserved for the next volume of these reports.

In the *British Medical Journal* for July 29th there is the commencement of a lecture, by the same physician, on *Hysterical Mania*. After pointing out the intimate relations that exist in the lower animals between the brain and the reproductive organs, he goes on to show that "the period of rut in animals is accompanied by mental activity, which borders on morbid excitement, while the gravid state of the uterus in females of our own species may lead not merely to change of temper, morbid appetites, and capricious eccentricity, but to chorea, somnambulism, amaurosis, convulsions, or mental derangement. On the other hand, a condition of mental agitation may derange the menstrual discharge, and ideas may modify the nutrition of the sexual apparatus. A very striking illustration of the power of a persistent delusion to induce changes in the vascularity of the uterus and ovaries was afforded lately by T. N., who is still an inmate of Ward 22. This woman, about whose exact age there seems to be some doubt, but who is certainly over fifty, was received here from Leeds on June 4, 1870. She is the mother of five children, the youngest of whom is fifteen years old, and was stated by her relatives to have passed through the change of life some four years ago. When admitted here she announced that, notwithstanding her age and other seeming improbabilities, she was two months advanced in pregnancy; and arguments and assurances, after a careful examination, failed to shake her belief in this fact. She very cogently remarked that she knew what it was to be in the family-way better than the doctors; and for seven months, in spite of the absence of every recognized sign of her alleged condition, held firmly to her singular belief. At the end of that time—precisely nine months from the date of conception which she had fixed—she intimated that labor-pains had commenced. She went to bed, and insisted on observing all the formalities of the lying-in room. She had a dose of castor-oil and some gin; she had a sheet fastened to

the top of her bed, and by that she held, at stated intervals, gradually diminishing in length, when she cried out as if in the pains of labor, manifested all the appearances of suffering, and broke out in profuse perspiration. Nothing could dislodge the idea that she was about to be delivered of a fine child. This went on for four days, when the abdomen became tympanitic, when she looked as if really exhausted by a protracted labor, and when—and this is the remarkable fact—menstruation recommenced after an interval of four years! The vivid belief had actually modified the circulation in the pelvic viscera, and caused them to resume a function which had been abolished in the order of Nature.”

The one constant element in all these cases of hysterical mania is a disturbance of the equilibrium between the nervous centres and the reproductive organs. The morbid process may commence in the brain or in the uterus; but in either case it spreads from the one to the other, and upsets that harmony and just proportion of function in which health consists. The mental affection is the more prominent feature in the complaint, but the uterine factor is not wanting, and it is the latter that confers upon it its distinctive characters. All forms of ordinary hysteria have some mental commotion or enfeeblement associated with them; and, indeed, so constantly is this the case that hysteria might not improperly be regarded as a mental disease. The incontinence of the emotions, the moral obliquity, the towering egotism, the positive delusions, which characterize it, are common to it, and to some recognized forms of insanity, and a slight increase in their intensity and persistency would amount to recognized mental derangement. But the singular fact is, that this slight increase very rarely takes place. Hysterical mania does not, as a rule, occur in girls who have been most acutely hysterical. It much more frequently attacks those who have manifested only hysterical tendencies.

The lecturer then goes on to show that hysterical mania is something more than exaggerated hysteria. An insane temperament must be combined with hysteria, and on the occurrence of any exciting cause the mania develops itself. He thinks that a distinction requires to be drawn more accurately than has hitherto been done between the nervous temperament, the hysterical temperament, and the insane temperament; and that it is in the coexistence of the last two of these that the risk of hysterical mania resides. “Where the hereditary taint of madness is present, and betrays itself in peculiarity of thought and feeling, and where at the same time the exalted sensibility and mobility of hysteria are also present to some extent, there is the appropriate soil for the growth of hysterical mania. If, under such circumstances, any irregularity of menstruation lower vital power and augment irritability, then almost inevitably we have hysterical mania. Or if, under such circumstances, intense annoyance or distress or disappointment be encountered, then again, almost inevitably, we have hysterical mania.”

In illustration of these views Dr. Browne records the case of S. H., who left the asylum on February 17th. This girl was admitted on the 2d of June, 1870, and was then seventeen years of age. She was a

weaver from Bradford. Her mother had been once temporarily insane and confined in an asylum, and a brother had also, for a brief period, been out of his mind. She had always been a hard-working girl, and had latterly overtaxed her strength by undertaking many household duties in the evening after her return from the mill, in order to help her mother, who was an invalid. Although she had never before exhibited any signs of mental disease, she had always been excitable and susceptible, and prone to blended outbursts of laughter and tears, which had ended occasionally in choking and twittings. Fourteen days previously to her reception in the asylum, her youngest brother, to whom she was fondly attached, died after a short illness. The bereavement preyed upon her mind. She was very quiet in her manner, and desired to be left alone, until ten days after the event, when suddenly, on the 28th of May, grave gave way to gay, the solemn to the ludicrous. She became hilarious and excited. In a few hours the excitement had passed into mania. Dances, gesticulations, snatches of songs, and ribald jests, occupied the night, and, with few and short interruptions, the next three days, until she was removed to the hospital. When admitted, her condition was typical of hysterical mania. She was of middle height, with brown hair, dark-blue eyes, and a pleasing and animated expression of countenance. There was none of the *facies hysterica* in her comely visage. She was exuberantly garrulous, chattering incoherently on a variety of topics, betraying no fixed delusions, but seizing upon whatever was said to her, and spinning it into the tangled and knotted thread of her discourse. She was quite able to comprehend whatever was addressed to her, and her will had evidently not lost all dominion over her conduct, for, when spoken to in a sharp and authoritative manner, she could remain quiet for a few seconds, until the impulse, through the vocal apparatus, became too strong for her, and broke out once more in voluble utterances. Her emotions were tinged with eroticism. She attempted to embrace the medical officers, and referred perpetually to love and friendship in phraseology which was not after the manner of Plato. She laughed immoderately and sang vigorously from time to time. Her pupils were of average size and sensibility; her skin was moist, her muscles soft and flaccid, and her tongue clean. The heart and lungs were healthy, the mucous membranes were pale, and the body, though plump, gave indications of anæmia. She was suffering from leucorrhœa. S. H. remained in the asylum for eight months, and twice suffered relapses, after having been apparently restored to health. For the first four months there was amenorrhœa with leucorrhœa; and, indeed, permanent recovery did not take place until the menstrual function was reëstablished in a proper manner. In this case we have an inherited predisposition to madness, an innate tendency to hysterical perturbation, a great grief, a weak state of health, and menstrual irregularity—in fact, all the conditions that tend to bring on this disease.

Dr. Browne then describes another very similar case, in which all the essential conditions for the production of hysterical mania were also present, except the menstrual irregularity; and this was absent

only at the outset of the attack, for during its progress the menses were suspended. "As the result of a large experience of hysterical mania, I am satisfied" (says Dr. Browne) "that it is without exception preceded or accompanied by some derangement of the reproductive system, the existence of which is most frequently indicated by alteration or obstruction of the monthly discharge. Even where, however, neither amenorrhæa, leucorrhæa, nor menorrhagia, can be discovered, other signs of disorder in the functions of the reproductive organs can be found, if carefully looked for. I well remember a girl, named E. B., laboring under hysterical mania, in whom no disturbance of the sexual system could be detected until, toward the close of the attack, distinct irritability of one breast came on. While the excitement lasted, and even after it had subsided, the left mamma was swollen, turgid, and the seat of uneasy sensation, aggravated by pressure, and reaching sometimes to exquisite pain. The consensus existing between the mammæ and the uterus, indicated by a variety of facts such as these—that a secretion of milk has been produced by irritation of the womb, and the catamenia by poulticing the breasts—entitles us to conclude that there was in this case some uterine or ovarian condition corresponding to the irritability of the mamma, and that there may be in other cases of hysterical mania a disorder of the reproductive system without any very conspicuous outward manifestation. We must bear in mind that inflammation or irritation of an ovary, or inflammation of the cervix uteri, may proceed to some extent without interfering with menstrual irregularity, or giving rise to any symptoms which would directly suggest their presence; and we must not, therefore, hastily conclude that there is no involvement of the reproductive system in hysterical mania, because we cannot at once detect it."

It is needless to state that this disease is confined to females, and in them it rarely occurs except between the ages of fourteen and thirty years. It is more frequent in single than in married women, and in the upper than in the lower classes of society. "During the last five years there have been only two cases of distinct hysterical mania in this asylum, in which the age exceeded thirty. In eighteen cases of which I have drawn up reports, the average age was twenty-one years. This fact in some measure accounts for the large proportion of single women attacked, as the incursion of the disease must often take place before the age at which women usually marry in this country. The hot-house education, and artificial and luxurious modes of life prevalent among the upper and middle ranks, are of course conducive to the evolution of hysterical tendencies. Even in a pauper asylum the victims of hysterical mania are seldom without some touch of refinement or a trace of sentiment."

The facility with which hysterical mania can be diagnosed is then noticed; and the first part of the lecture concludes with a reference to other forms in which hysteria occurs in lunatic asylums. Dr. Browne mentions two cases then under his care in which dementia and epilepsy are associated with hysteria, and one in which melancholia and hysteria are associated.

The lecture is concluded in the *British Medical Journal* for Au-

gust 5th, in which the symptoms, prognosis, and treatment of hysterical mania are considered :

"The prelude to the attack are generally debility, with defective appetite and menstrual disorder. The attack itself begins suddenly, either without any warning, or after a few days of depression or silent reserve. Loquacity and restlessness are its earliest and most permanent symptoms. Philosophers have asserted that women possess a superiority over men in their powers of conversation, and this remark is powerfully confirmed by the disease under consideration. The untiring vigor with which a delicate-looking girl will talk incessantly for twenty-four hours is positively menacing. She seems to gather strength as she goes on; for, as the disease advances, volubility becomes greater. The utterances thus fluently poured forth are at first disjointed but rational sentences, inopportune but sharp and comprehensible remarks, and then more broken and interjectional phrases. The incoherence in this disorder, however, is never comparable with that of acute mania, even in its worst phases, as some shreds of sense may be found in it—some laws of association may be observed to regulate it. In the midst of a torrent of what sounds meaningless chattering, you will be surprised by some clever or pertinent expression—some words that prove that memory is active, and that perception is acute. Very soon after talkative excitement is established, it assumes an emotional complexion. This is happy and joyous, and there are fits of laughter and musical outbursts; or pensive and sad, and there are profusion of tears and convulsive chokings. Most frequently these emotional states alternate with each other, while the mind is gradually 'sicklied over with the pale cast of' eroticism. In a great majority of cases the morbid excitement of what has been called the tender emotion is distinctly observable. There is increased agitation produced by the presence of a member of the opposite sex; there are rhapsodies addressed to some real or ideal lover; there are sentimental cravings; there are passionate invocations; there are lascivious movements, obscene speeches, and even filthy acts; and along with these erotic manifestations there are perverse and mischievous propensities. Dugald Stewart said that women surpass men in docility and aptitude to learn. After watching a few cases of hysterical mania, you will see reason to doubt at least the first part of that statement. The intractability, obstinacy, and noisy spitefulness displayed, are truly disheartening to those who have to deal with them. In the worst cases there are also destructiveness, violence, and degraded habits, and perverted appetites leading to consumption of cinders or garbage. Throughout the disease, however, in the worst cases as well as the mildest, a peculiar rallying power is generally preserved. Self-control is not altogether lost. The current of excitement can be stemmed for a few seconds. A degree of intelligence can be exhibited which seems incompatible with such decided mania. As the excitement diminishes, and recovery is approached, there is either depression of spirits, listless indifference, or acute sensitiveness. In some cases there are confusion of thought, a sense of bewilderment, and an obliteration of memory as regards the whole, or large portions of the attack.

"Along with these mental symptoms there are, at the beginning of hysterical mania, headache (often limited to the frontal region), loss of appetite, and muscular tremor. In a few cases there is also spinal tenderness in the dorsal region, with pains in the abdomen and legs. Pallor of the countenance and dilatation of the pupils are always present. The pulse is only slightly increased in frequency; the skin is cool and moist; and the tongue clean, or only coated with a thin white fur. There is usually a profuse flow of light-colored limpid urine. A very fair amount of sleep is obtained; but, as the attack progresses, this gradually lessens in amount, until, at its height, the whole night is perhaps passed without even a snatch of rest. As sleep is reduced in quantity, cutaneous sensibility is heightened, until a state of general or local hyperæsthesia is attained. The slightest touch causes or seems to cause sharp pain. This condition, however, is not constant, but comes and goes, and is occasionally replaced by anæsthesia or bluntness of feeling. There is invariably muscular restlessness throughout the whole stage of excitement. The play of features, or rather the contortion of the face, is constant and inexhaustible. All sorts of gestures and gesticulations are practised. Spasms and twitches affect the voluntary muscles, and sometimes the involuntary ones also, producing choking, hiccough, and griping pains. Not rarely there is a vehement trembling of the eyelids, and also palpitation of the heart. The excitement and rapid movements cause some acceleration of the pulse and elevation of temperature, but ordinarily the pulse and temperature undergo less change than might have been anticipated. A sudden and transitory rise in either may happen without any obvious explanation, but their average range is tolerably normal. As the attack proceeds, constipation of the bowels comes on, as well as menstrual irregularity, if that has not existed before the incursion of the insanity. Throughout the whole attack, the body retains its plumpness in an almost miraculous manner. Notwithstanding that little food is taken, and that wear and tear are excessive, emaciation is warded off. When convalescence is reached, weakness is much complained of, and also, frequently, pain under the left breast, first described by Dr. Todd, and referred by him to reflex sensation. If I might venture in any way to amend what has been stated by so eminent an authority as Dr. Todd, I would tell you that this pain is felt more in the splenic than in the submammary region; and that it is in a few cases associated with profound anæmia, without leucorrhæa. Along with this pain, during convalescence after hysterical mania, there are occasionally gastrodynia of a severe kind, and various erratic neuralgic pains. Respecting the duration of an attack of hysterical mania, I can give you no reliable information. In some cases it terminates in a few days; in others it continues for months. It is rarely, however, that any one attack, even when unmodified by treatment, lasts more than three months."

Dr. Browne then gives a very graphic sketch of a case of this disease that occurred in a dress-maker, and previously a pupil-teacher in a Wesleyan school, aged eighteen, who was lately discharged cured. She was perfectly well up to the beginning of last September, when

for two days she seemed very quiet and dejected, after which she suddenly burst into vociferous cheerfulness. The symptoms becoming more marked, she was admitted into the asylum on the 20th of that month. She was then talking loudly and rambling in her conversation, introducing fragments of texts and prayers. She could not remain in one position, but paced up and down, tossing her arms about, and complaining of pain on the right side of her head, and down her spine. During the night of the 20th she slept well, but, as soon as she awoke on the morning of the 21st, recommenced to vociferate. She also wept and laughed, and could not be persuaded to take much food. On the 28th of September, she is reported as somewhat more composed, and as having taken abundant nourishment, but being so weak as to be unable to stand. On the 30th she is said to be very excitable and unmanageable; also more incoherent and destructive, having torn up some clothing and flowers in the airing-court. "A specimen of her incoherence was taken down *verbatim*, and I now read it to you: 'Gold, silver, wax-works, yellow, pink, and white—Get a substitute—Reverend so and so—Plenty of law-givers—Two brothers—Bible—Eternal life and death—A man I love to honor—Honor to whom honor is due—My master—Give him a life-pill—Self-praise is no recommendation—Venerable old age—Fox and Pitt.' All this, and endless quantities of the same stuff, with the most extraordinary volubility. On October 1st, the entry is in the case-book: 'Pulse 90; tongue clean; takes her food indifferently, talking incoherently, but remains in bed.' On the 2d it is: 'Has been much excited all day, crying out in a loud, harsh voice, very emotional; attitudinizes, and throws herself into tragical postures; is alternately erotic and religious in her conversation—love, however, being her chief theme. Pulse 130; tongue clean; bowels have not acted for two days.' On October 3d, has had some broken sleep; very incoherent and mischievous; raves mostly about some one named 'Cavosa,' to whom she refers in amorous terms; pulse 120. On October 4th, is a little quieter; pulse 123, and irritable; pupils much contracted; face pale; tongue clean. On October 12th, is decidedly improved, capable of rational conversation; has not menstruated for six weeks. On October 23d, still improving, but very weak; is quiet and downcast; employed in sewing. After this she gained ground steadily until the date of her discharge."

Nothing need be said regarding Dr. Browne's observations on the diagnosis of this disease, which can only be confounded with acute mania, and the excited stage of acute dementia, from both of which it may easily be distinguished. The prognosis is equally simple and always favorable; and consequently there cannot be any morbid anatomy of this disease. I proceed, therefore, to his concluding remarks on the treatment of this affection, which must be materially modified by varying conditions. "Its occasionally transitory nature" (he observes) "justifies a trial of home-treatment before an asylum is resorted to; but if under home-treatment it remain unabated at the end of fourteen days, then removal should not be any longer delayed. The most protracted and troublesome cases that have fallen under my ob-

ervation have been those in which home-treatment had been persevered in for months, until patience had been exhausted. The prolongation of the disease increases the risk of relapse, so that it is of much importance to cut it short at the earliest possible moment. During the maniacal condition there is not much room for moral treatment. A conciliatory and yet firm manner on the part of the physician, however, is not without its effect. Quietness and rest are also advantageous, and any simple occupation, such as sewing, if its adoption can be secured during an interval of tranquillity, is often very useful. It fixes attention, and by its very monotony soothes the perturbed mind. Exercise in the fresh air ought to be taken daily, and nourishing food must be administered. The medical treatment I generally begin with is, a mixture containing bromide of potassium and tincture of valerian—forty grains of the former, and a drachm of the latter in each dose, to be taken three or four times a day. If, however, its beneficial action be not very speedily manifested, no good will result from continuing its employment. I should recommend you, then, to resort to morphia and assafoetida. From a quarter to half a grain of the muriate of morphia, with from ten to thirty grains of assafoetida, may be given twice or thrice a day. The tincture of assafoetida is not objected to in pauper asylums. This treatment is generally successful; but should it fail, as it sometimes will, then *cannabis indica* with bromide of potassium ought to be tried. We have employed it here constantly since 1867, and with decisive benefit in many cases. The use of narcotics is not contraindicated in hysterical mania. Warm, tepid, and even cold shower-baths are sometimes composing and useful. During convalescence, iron is almost always required, sometimes quinine also. I have a particularly high opinion of the value of Easton's syrup of the phosphates of iron, quinine and strychnia, during recovery from hysterical mania. Of course, menstrual disorders must be subjected to their appropriate treatment."

Puerperal Mania is the subject of a valuable essay, by Dr. Madden, ex-Assistant Physician to the Rotunda (Dublin) Lying-in Hospital, published in the October number of the *British and Foreign Medico-Chirurgical Review*. Excluding from true puerperal fever the form of mental disturbances sometimes occurring during pregnancy, and sometimes resulting from over-protracted lactation, he begins with the etiology of the disease, from which I extract the following paragraphs:

"In many of the cases of puerperal insanity which have come under my observation, no predisposing cause was ascertained to exist. But in others, and these the larger number of cases, the disease in question was evidently connected with physical want and mental distress. Previous mental disease and family predisposition to insanity had existed in several cases. The average age of the patients affected with puerperal mania corresponds very closely with the period of life at which pregnancy is most frequent. Thus, of 1,996 cases of puerperal mania which I have collected from various authorities, in 1,239 cases the disease occurred between the ages of twenty and thirty. The number of primipara attacked by puerperal mania is greater in very

young and very old women in proportion to the total number, and more especially so in persons advanced in life. The same tables also prove that primipara are more liable to puerperal mania than multipara.

"The condition of the patient as to marriage appears to have a marked influence in the causation of this disease. A large proportion of the cases of puerperal mania occur in unmarried women. Thus, of the patients suffering from mania after parturition, that I have seen, twelve out of the twenty were unmarried. In their case the pangs of labor are assuaged by no moral consolation; the present is full of anguish, and the future is lighted by no ray of hope. Can we wonder that these poor creatures—predisposed to disease by the combination of every moral as well as physical cause which could depress their vital powers, indifferent to life, nay, even, as I have too often heard them, wishing for death—should, under such circumstances, be peculiarly liable to puerperal mania as well as to metria? The pregnant state itself appears to predispose to functional cerebral disturbances in many cases. To this fact may be referred those otherwise unaccountable alterations in tastes, habits, and dispositions, that irritable condition of mind and temper, those unreasonable likings and aversions, those irresistible longings, and foolish fancies, which, in some women, invariably accompany pregnancy. The ordinary exciting cause of puerperal mania is the injudicious kindness of the patient's family and friends, who, too often, insist on being admitted to visit her. I have seen so many examples of the ill consequences of such visits in causing mental excitement that, as far as possible, I now exclude all visitors from the lying-in room until the patient is able to sit up. For the same reason all unpleasant news, or any conversation which might in any way excite her, must be avoided. I have known puerperal mania follow from a patient being allowed, by an injudicious nurse, to read a letter containing some unexpected family intelligence on the eighth day after delivery. With few exceptions, the cases of puerperal mania that I have seen manifested the symptoms of the malady within the first week after delivery; and this fact is, to some extent, a confirmation of the old idea that the complaint in question is connected with the irritation caused by the secretion of milk, especially if this be disturbed or put back, in which case a metastasis to the cerebral system was held to take place. Dr. Horatio Storer, of Boston, has, in his recently-published work on 'Reflex Insanity in Women,' with great ability advocated the view that the frequency of insanity in females is owing to reflex irritation caused by ovarian or uterine derangements. The same theory has been applied to explain the cause of puerperal mania. There can be no doubt, however, that toxæmia, or puerperal blood-poisoning, plays at least as fully important a part in the causation of puerperal mania as reflex irritation does.

"Two distinct *forms* of puerperal mania have come under my observation, viz: 1. Violent mania, attended with symptoms of inflammation of the brain, or of its meninges; and, 2. A low form of mental disturbance, in some cases presenting the symptoms of melancholia, in others, and much more commonly, closely resembling trau-

matic delirium. The acute inflammatory form is generally earlier in the period of its occurrence after labor than the slow, desponding type of the disease, and is, moreover, generally more favorable in its prognosis, as far as the mental condition of the patient is concerned. It is of great importance to watch for and detect the premonitory symptoms of puerperal mania, for, thus detected, the approaching disease may oftentimes be warded off by proper treatment. I have seldom seen a case of this kind which was not ushered in by a premonitory stage of insomnia, quickness of pulse, and an alteration in the patient's manner, which generally became discontented and quarrelsome with those about her.

"In some few of these cases, however, the disease appeared to commence suddenly, without any premonitory symptoms being noticed. In one case the patient awoke suddenly delirious, having been frightened in a dream, and having been apparently well when she went to sleep. In another, the disease was ushered in by an attack of epileptiform convulsions, on the subsidence of which the patient was found delirious; and, in a third, a determined attempt to kill the child was the first thing to attract attention to the patient's mental condition. I may here observe that a decided aversion to some person who, if in her normal state of mind, should be dearest to the patient, and more especially to her child, was the most common and most prominent symptom, as far as my experience goes of this disease. Erotomania and obscenity were not very commonly observed in these cases. But in some of them obscene ideas and expressions appeared to have entire possession of the patient's mind.

"Obstinate silence was a striking feature in two of my cases, the patients refusing for some days to reply to any questions, although it was obvious that they understood the observations made in their hearing, and the questions put to them.

"With regard to the *prognosis* in cases of puerperal mania, there are two distinct questions to be considered: first, the probability of death from the disease; and, secondly, the likelihood of the malady eventuating in permanent insanity. The majority of cases of puerperal mania terminate in recovery; the next most frequent result of the disease is death from it; while the least common termination is in confirmed insanity.

"Thus summing up all together all the cases of which the termination has been recorded of puerperal mania that I have either observed myself or met with in the course of my reading on this subject, I find that, out of every 1,000 cases of puerperal insanity, 668 recovered within six months of the attack.

"With regard to the *treatment* of puerperal mania, the indications are, first to allay the nervous irritation; and, secondly, to support the patient's strength, recollecting that this is generally a disease of an asthenic type. In most cases it was found necessary to commence the treatment by removing any source of irritation from the *prima via* by purgatives or laxative enemata, as the case might require. It has been before observed that puerperal mania is usually ushered in by diminution and sometimes by complete suppression of the milk and lochia;

hence our first effort in such cases should, I think, be directed to the restoration of the suppressed discharges or secretions, or, failing in this, the substitution of some other channel for the elimination of the *materies morbi* from the system.

"The renewal of the secretion of milk may be encouraged by applying the child to the breast, or by the breast-pump. The lochial discharge may be stimulated by warm baths, poultices, and stupes to the vulva, stimulating enemata, and cupping over the sacrum, or even, as recommended by some French writers, the application of leeches to the vulva.

"Bromide of potassium, which possesses such marked power as a sedative in most diseases dependent on uterine irritation, was found very serviceable when the puerperal mania was of slight severity, or of the hysterical form. In such cases it was administered in doses of from ten to twenty grains every second hour; and by its use in this way I have, I believe, succeeded in warding off puerperal mania in cases in which all the premonitory symptoms of the disease had manifested themselves.

"Chloral is, in my opinion, one of the best nervous sedatives and hypnotics that can be resorted to in the greater number of those cases of puerperal mania in which this class of remedies is indicated, and in which opium, hyoscyamus, camphor, and other similar medicines are either contraindicated for reasons which I have already spoken of, or fail to produce the desired effect. In such cases I have sometimes given chloral with great benefit in procuring sleep, and allaying nervous excitement. However, I should add that, in some of the worst cases of puerperal mania in which I have succeeded in obtaining sufficient sleep for the patient by the use of chloral, the disease has continued unabated notwithstanding. In ordinary cases, from ten to thirty grains of chloral have sufficed to produce sleep."

Dr. Madden places little reliance on opium in these cases, thinks that belladonna should be given with extreme caution, and praises tartar-emetic in small and repeated doses when there is much excitement.

"As a rule it is necessary in these cases to separate the patient from her family, and more especially from her husband and child. This seclusion was of course better carried out in the hospital practice, the patient being removed to a separate ward, and better watched than she would be in a private house. A patient threatened with puerperal mania should never be left for a moment unwatched by a strong and experienced nurse, to guard against the possibility of her injuring either the child or herself."

In a paper in the "West Riding Reports," on "The Sphygmograph in Lunatic Asylum Practice," Mr. Thompson, after giving the characteristics of the healthy pulse and of the pulse in pyrexia, proceeds to consider the pulse-wave in cases of general paralysis. Various cases of this disease in different stages are described, and the corresponding tracings by the instrument given. I must content myself with quoting the author's recapitulation of his essay: "General paralysis of the insane is a disease which may be presumed to be owing to a consider-

able extent to persistent spasm of the vessels, which leads to change in their component elements, but more especially in the muscular substance. This persistent spasm, by reducing the amount of blood which can pass through the vessels to the parts to be nourished, prevents renewal of these parts, and consequently wasting. The most rational treatment indicated is to relieve this spasm. Further, the sphygmograph, by indicating the true nature of the disease at a period when it could barely be suspected by other symptoms, affords an opportunity of applying remedies, when mere function is disturbed, before actual change has begun, and when the remedial means can be of the most avail."

The succeeding paper in the same volume, by Mr. Aldridge, on "The Ophthalmoscope in Mental and Cerebral Diseases," is a most valuable one. He begins by reporting several cases of "ophthalmoscopic examination of the dying and the dead," which were instituted before he was aware that Poucet had previously worked at the same subject. As these two observers slightly differ, we shall give an extract from Poucet's paper before stating what Mr. Aldridge says:

"On examining the eyes of the human subject, the following were the appearances seen in one case seven hours after death: Papilla white, pearly, distinctly differentiated in tint from the general fundus of the eye, which was yellowish-white, with a slightly rosy hue. Not a single vessel visible at the papilla. At the periphery very small irregular clots were contained in otherwise empty vessels, and these succeeded each other at short intervals. The arteries could not be distinguished from the veins, and the choroidal plexuses were also indistinguishable."

The observations of Mr. Aldridge in some respects agree with those of M. Poucet. Only it will be noted that exactly the same conditions did not obtain in every case. In four cases clots formed in the veins, and in three no vessel could be seen to contain blood in that portion which passed over the optic disk. M. Poucet says that the arteries could not be distinguished from the veins, nor can this be wondered at when we consider that his observations were made eight hours after death, for in the above cases the arteries were seen to empty themselves, so that they had almost ceased to be visible half an hour after death, and had completely disappeared in six hours. He found the choroidal plexuses indistinguishable seven hours after death, so that in the above cases, although they were well seen immediately after death, yet, six hours after, they had ceased to be evident, and the choroidal glow is then described in terms closely corresponding with those used by M. Poucet.

On carefully considering the above cases there are several points which seem common to the whole: First and most notably the fact that the capillary tint of the optic disk is the first to give way; secondly, that the arteries begin to empty themselves in the direction of their current; and, lastly, that the veins also empty themselves in the direction of their current, but do not do so completely. These processes are all in accordance with the known physiological behavior of vessels, and would *a priori* have been expected to take place. The only

irregular proceeding was the disappearance of the capillary tint before the arteries had thoroughly emptied themselves, because the blood which they passed on must have found its way into the capillaries, and one would therefore have expected them to have remained full until after the arteries had ceased to contract. That no change took place in the veins after the first few minutes can be easily accounted for by the fact that, as soon as the capillaries had become empty, the motor power had ceased to operate upon the venous blood.

The next inquiry is, What value these signs possess as a mode of determining whether death has actually taken place? The writer enumerates the ordinary known signs of death, adding that "still the fact remains that persons have been buried alive when in a condition so nearly resembling death that medical men could not detect any signs of life," and referring to the well-known case of Colonel Townsend, who was left for dead by Drs. Cheyne, Baynard, and Skrine. The appearances of the fundus oculi would become of immense importance in a medico-legal point of view, he observes, could we come, by a great number of observations, at certain definite conclusions as to the appearances characteristic of various modes of death, and regarding the period that life had been extinct. The latter point would obviously have an important bearing on the question of survivorship. This is no doubt true, but at present we have no sufficient data.

The next section is devoted to "Observations on the Eyes of Epileptics," both during the paroxysm and the inter-paroxysmal period. In five cases the eyes were observed during the paroxysm, but in only one of them (No. 1) was an eye examined during the actual convulsions, the observations being in most instances made during the subsequent stage. The following is his analysis of them: The first thing observed in each case, and one common to them all when in the stage of stupor succeeding the convulsion, is great paleness of the optic disk, showing emptiness of the capillaries. Next, there are smallness and attenuation of the retinal arteries—this, of course, one would naturally expect to find in conjunction with loss of capillary tint; and, lastly, there is a restoration of the circulation, more or less complete. In one case, that of No. 4, this restoration of the circulation was somewhat sudden, and overstepped the natural bounds, being coincident with great excitement and mental confusion. During the convulsive stage, in the case of No. 1, the optic disk was seen to be greatly injected, and the arteries larger than usual; this condition being succeeded by paleness of the same part, and contraction of the arteries, coincident with the stage of stupor.

I must pass over his remarks on the relation which these conditions bear to the phenomena of the fit, and how far they coincide with the current theory of epilepsy, and next proceed briefly to notice his observations on one hundred cases (which he gives in detail) instituted during the inter-paroxysmal period. His general conclusion is, that in the great majority of them a condition of passive hyperæmia of the retina and optic nerve exists, while in some few cases the congestion is active, and is the forerunner of inflammation or of "a descending neuritis."

"In twenty-six cases the veins are recorded as being tortuous; and

of these in eighteen cases they are said to be large, in six of medium size, and in two cases only were they small.

"In thirty-two cases the veins are described as being large but not tortuous; and in thirty-five they are said to be of medium size. In seven cases only are they spoken of as small. We thus find that in fifty cases, or one-half, the retinal veins have been found to be abnormally large; and not only is this the case, but of the remainder many are described as being 'numerous,' 'much branched,' and often 'tortuous.'

"The optic disk, in nearly every instance where there was enlargement of the retinal veins, was found to be of a deep-red tint. Very little alteration was observed in the arterial supply; in some few cases the arteries are said to be small and thready, and in those some atrophic changes were observed. It may be proper here to mention the fact that the central white spot, which for a long time was thought to be devoid of blood-vessels, could be seen in many cases to be of a slightly-pink tinge, and in others of even a deeper shade than this; thus confirming the statement of Niemetschek that he has observed a capillary net-work covering it."

After going into the evidence in support of the view that the appearance observed in the retinal circulation may be taken "as an index and guide to the condition of the cerebral," and showing that the ophthalmoscope is of considerable use in the estimation of the effects of treatment of acute mania, combined with epilepsy, by ergot of rye, he proceeds to the last section of his subject, viz., "Ophthalmoscopic Observations on the Action of Remedies."

The remedies whose action on the retinal circulation he investigates are ergot of rye, nitrite of amyl, nitrous-oxide gas, and hydrate of chloral.

His conclusions regarding the action of ergot of rye, as based on four cases, will, he thinks, "establish the fact that ergot produces contraction of the minute arteries of the retina; and also that such effect is not produced instantaneously, but that some time is required before any evident change can be seen; and that to obtain the full effect it must be taken for several days, so as to bring the patient thoroughly under its influence."

Short notices are given of eight cases in which nitrite of amyl was administered, but nothing is stated regarding its general therapeutic effect. As this is a remedy not very widely known, I shall transcribe one of the histories before giving the conclusions at which our author has arrived regarding its ordinary effects on the retinal circulation:

"M. H., the subject of epilepsy, and considerably demented, inhaled the nitrate of amyl for about one minute. Her face became flushed, and the flushing was seen to involve the whole of the head, face, neck, and upper part of the chest over the sternum. The parts became of a bright-scarlet color, most intense on the face, sides of the neck, and lobes of the ears. The eyes glistened, and a slight flow of tears was excited. Her pulse increased twenty beats in the minute, and became fuller in character. About this time she began to be

talkative and inclined to laugh; but afterward there seemed to be some mental confusion, as on leaving the room she did not know which way to turn to go to the day-room of the ward she had lived in for many months. When the flush was deepest the eyes were examined, and the retinal arteries found to be increased in size, together with deepening of the capillary tint of the disk, but no alteration in the size of the veins."

The nitrite was administered to a great number of persons, both sane and insane, male and female, and always with the same effect. In every case the flushing commenced at several different points, the most frequent being the tips of the nose and chin, the skin over the malar bones, and the recesses of the outer ear; from these it spread until it had involved the whole of the surface of the head, neck, and front of the chest. In one case only was this increased vascularity seen to affect the skin of the abdomen. Every one in the first instance declared that the smell of the vapor was unpleasant, but after trying it a second time they seemed to enjoy it, so that in some cases it was with difficulty that the inhalation was stopped. The next fact worthy of note was the feeling of bewilderment and confusion complained of in the head. The hand was put up to the forehead as though they had just awaked from sleep. The flush was noticed to become more intense, and of a brighter scarlet, after the bottle had been removed from the nostrils, and a few inspirations of pure air had been made. It was at this time that the retinal circulation was observed, and from the above cases it will be seen that the arterial and capillary circulation was always greatly increased, the effect being observable here as soon as in any other portion of the systemic circulation. As the mental confusion passed away, the patients always became talkative, and were easily excited to laughter, which in one case assumed an hysterical character, and ended in weeping. They complained of a feeling of heat, and tingling of the ears and cheeks, but no other disagreeable feeling was experienced; indeed, the novelty of the sensation and the joyous appearance of persons who had inhaled prevented any lack of subjects for observation.

Mr. Aldridge examined the eyes of two persons to whom his friend and colleague Dr. Mitchell had been giving nitrous-oxide gas, and from these somewhat scanty data he draws the following conclusions:

When in the excited and hilarious condition which results from inhalation of the nitrous oxide mixed with air, and when the head and neck were deeply flushed, the retinal circulation was seen to be in a state of excitement, the arteries being dilated, and the capillary tint of the disk deepened. In fact, the changes then seen very closely corresponded with those detailed above, as seen after the administration of the nitrite of amyl.

In three cases he examined the eyes of patients under the influence of chloral hydrate, and the deductions, if any might fairly be drawn from such a small number of instances, would be that the chloral hydrate increases the calibre of the arteries, and consequently the vascularity of the retina until such times as the patient falls asleep, and that the anæmic appearances seen at the latter period are those which are

said to be characteristic of healthy sleep. [This fact was first observed by the editor of this JOURNAL, "On the Physiological Effects and Therapeutical Uses of the Hydrate of Chloral," NEW YORK MEDICAL JOURNAL, February, 1870, p. 469.]

He seems fairly to have proved that "in the ophthalmoscope we have a most useful instrument for investigating the effects of remedies on the system."

The memoir, which extends over nearly sixty pages, is highly creditable to the author, and must have been the result of much scientific labor.

Dr. Clifford Allbutt's treatise, "On the Use of the Ophthalmoscope in Diseases of the Nervous System," has just appeared, and will doubtless contribute materially to the diagnosis of diseases of the brain. I may probably notice it in my next letter.

Dr. Hughlings-Jackson continues, in the *Medical Times* for September 16th, the lecture "On Optic Neuritis from Intracranial Disease," the beginning of which was noticed in my last letter.

In his remarks on the nature of the intracranial disease most often associated with double optic neurosis, he makes the two following statements:

"1. There is usually a gross change, or, as I have called it, 'coarse' disease. I have seen double optic neuritis with glioma, hydatid cyst, abscess, syphilitic 'deposit,' and with blood-clot. In short, by gross or coarse disease, I mean a 'lump of something'—an adventitious product. The second statement is implied in the first. 2. Double optic neuritis does not point to any *particular* kind of coarse disease, but simply to coarse disease of *some* kind. I think this generalization is most important. You will properly say that the several adventitious products I have named are quite different things. This is obvious enough, but they are all alike in this—each is a 'foreign body,' and each may produce just the same kind of optic neuritis.

"That some 'foreign bodies' are more likely to produce optic neuritis than others, I need not deny. The question is much more difficult than appears at first glance. There is the position to be considered, for certain adventitious products affect particular localities. Thus, the rule is, that abscess occurs in the mass of the cerebrum or cerebellum, and blood-clot in the motor tract. Blood-clot is very rarely associated with simple optic neuritis (not very uncommonly with the neuro-retinitis of Bright's disease). I have never seen optic neuritis in recent cases of cerebral hæmorrhage. So rarely does double optic neuritis occur from clot, that if you find it in a patient who is hemiplegic, and whose history seems otherwise to indicate clot, you should, at all events, consider the diagnosis of tumor to be as likely as that of clot, for hemiplegia occasionally comes on suddenly from tumor (probably by hæmorrhage from the tumor). If we know the double optic neuritis to have been present at the time when the hemiplegia came on, we should diagnose tumor. If it come on some weeks after, we should be in doubt; but even then tumor is more probable."

Dr. Hughlings-Jackson admits that, as no one consults him for defect of sight only, but for such symptoms as severe headache,

convulsion, and hemiplegia, with which optic neuritis often occurs, his experience is necessarily one-sided; and he further admits that, in a few cases of severe cerebral disease where he has discovered double optic neuritis, he has found no kind of coarse disease post mortem. He has been wrong several times in the diagnosis of an adventitious product within the skull in cases where there had been found double optic neuritis, but he has been far oftener wrong in saying there was an adventitious product when the disks were normal, and wrong in saying there *was not* when there was double optic neuritis. He feels, therefore, justified in saying that double optic neuritis does point *very strongly indeed* to coarse disease inside the head. He admits that he cannot always tell *by the ophthalmoscope* whether there is optic neuritis or the so-called swollen disk; but this, he maintains, matters less than at first glance appears in the *diagnosis* of the nature of cerebral disease. "If you find swelling of the disks, with or without hæmorrhages, with tortuosity of the veins, and obscuration of the course of the arteries, you may—whatever you call or however you explain these appearances—infer, in the vast majority of cases occurring in *medical practice*, that there is an adventitious product within the head. You usually have other evidence, as severe pain in the head, and perhaps urgent vomiting.

"In chronic cases you will scarcely ever be wrong, in acute cases there is more difficulty. In some cases of tubercular meningitis, and in some cases of pyæmia you may find a swollen disk—or find a disk much swollen, let us say—but, so far as I have observed, only shortly before death. In the cases of pyæmia there is no difficulty, because the diagnosis of that affection by other kinds of evidence is easy. And in most cases of meningitis, tubercular or non-tubercular, I have not seen any considerable alteration of the disks even shortly before death—nothing so marked as any of the stages of optic neuritis I have described. In a case of universal meningitis I found no morbid ophthalmoscopical signs (see *Medical Times and Gazette*, November 2, 1867); and recently, in another, I found, after very careful examination, at the most only enlargement of the large retinal veins, and this was a few hours before the patient's death, when respiration was very much embarrassed. The disks were also examined by Mr. Waren Tay. The meningitis was basal, and there was a cerebral abscess as well."

The conditions under which double optic neuritis scarcely ever occurs are then considered; and it is obvious that their negative evidence is extremely valuable. "Optic neuritis," he observes, "very rarely occurs in those cases in which there is no coarse change—no adventitious product. It does not occur, or very rarely occurs, in the neuroses. It is rare in chronic and general convulsions (epilepsy), although not uncommon in partial convulsions, e. g., convulsions beginning in the face, arm, and leg; in the former there rarely is *coarse* disease (no lump), in the latter there frequently is. I have never seen double optic neuritis in chorea. Now, chorea, I think, depends on plugging of small cerebral arteries; but, at all events, it does not depend on gross change. I have never seen optic neuritis with hemiplegia from local softening, the result of embolism or thrombosis."

It being thus shown that in most cases there is a cause of the neuritis in some coarse cerebral disease, the next point is to ascertain, if possible, where this disease is placed. Contrary to what might be expected, the coarse disease does not, as a rule, directly involve any known part of the optic tract. There may be disease of the base of the skull which involves the optic nerves, but *double* optic neuritis does not help to the diagnosis of it. Thus, while double optic neuritis usually implies the existence of an adventitious product within the cranium, it tells nothing *by itself*, and without these symptoms, as to the seat of that product.

[In a foot-note to an early part of the lecture, Dr. Hughlings-Jackson gives a valuable list of the "adventitious products" and their localization, that he met with in his own observations, during the last eight years, in cases of double optic neuritis. They are as follows: 1. Cancer of the base of the skull, and middle lobe of brain; 2. Tumor in the cerebellar fossa, tumor at the sella turcica, and in the left posterior cerebral lobe; 3. Hæmorrhage in the left cerebral lobe; 4. Tumor of the right hemisphere; 5. Blood-clot; 6. Syphilitic mass in the right cerebral hemisphere; 7. Softening of several convolutions of hinder part of anterior lobe; 8. Tumor of the right corpus striatum and neighboring convolutions; 9. Syphilitic disease of each cerebral hemisphere; 10. Abscess of left cerebral hemisphere; 11. Abscess of right cerebral hemisphere; 12. Large hydatid cyst of left cerebral hemisphere; 13. Syphilitic disease of right cerebral hemisphere; 14. Disease of the surface of right cerebral hemisphere, supposed result of abscess; 15. Syphilitic disease of the brain; 16. Tumor of cerebellum; 17. Syphilitic disease of the left hemisphere; 18. Glioma of left hemisphere; 19. Syphilitic disease of each cerebral hemisphere; 20. Tumor of middle lobe of cerebellum; 21. Glioma of anterior cerebral lobe; 22. Glioma of crus cerebri; 23. Tumor of left cerebral hemisphere and of each cerebellar lobe.]

II.

PHYSIOLOGY AND PATHOLOGY OF THE BRAIN AND NERVOUS SYSTEM.

PREPARED BY DR. H. D. NICHOL, OF NEW YORK.

1.—*Experiments upon the Mechanics of the Nerves and Nervous Centres.* By Prof. W. WUNDT. 1. Abtheilung. Erlangen, 1871. Enke. (Psychiatrisches Centralblatt, 25 Juli, 1871.)

THE first part of Wundt's "*Untersuchungen zur Mechanik der Nerven und Nervencentren*," which treats of the nature and origin of nervous excitability, is just published. It is impossible to give here even an abstract of what is said in relation to the origin of nervous excitability, since it includes a most complete and carefully prepared physiology of the entire nervous system, with an accurate description

of all his experiments. At the end of the first part of the work, he attempts to theorize upon the nature of the changes which take place in the nerves, basing his theories entirely upon certain conclusions, deduced from his experiments—conclusions which are in complete accord with all of our previous ideas in reference to the molecular changes in the organism.

He recognizes two kinds of processes as going on in the nerves. Those changes, of a chemical nature, which are necessary for the nutrition and sustenance of the nerves, he designates by the term "internal molecular process." They consist, essentially, in the transformation of the feebly-oxidized and closely-packed-together elements in a condition of a higher degree of oxidation, and of less close union. By this change, active force is generated, and hence he terms this part of the internal process the "*positive* molecular process." Besides this, there are other changes taking place within the nerves, consisting in the renewal of the complex and badly-oxidized structures, which represent the author's "*negative* molecular process"—hereby, active force is changed into and united with elastic force.

The action, resulting from the irritation of a nerve from without inward, he calls the "irritation-process;" and this, together with the impulse transmitted to its muscle by the irritated nerve, composes the "excitation-process," the external process. The force, set free in a nerve by the action of any irritation, is not wholly directed to the developing of its mechanical effect (upon the muscle); for, a portion of it is diverted to the internal molecular process in the nerve itself; but this portion also, until it has actually been absorbed into the internal process, belongs to the excitation-process.

Several propositions follow, whose aim is to explain, from these premises, the known processes which take place in an irritated nerve. Among the most important is the second one—that "the irritation-process applied to the nerve always becomes changed, first, into the internal molecular process, and then (out of the latter) arises the excitation-process." It is demonstrated how, by each act of the irritation-process, the internal molecular process becomes essentially changed, and made to exercise a restraining influence—the result of one portion of the change being an increase of another portion, a decrease in the force of the excitation-process.

From the number and order of occurrence of each of these processes, and from the manner in which each acts upon the succeeding one, a ratio of the gross result may be made, viz., of the excitation-process to the irritation-process, thus presenting the very fundamental principles of the physiology of the nerves in the form of a simple proportion.

For the details of this theory, the original work must be consulted.

2.—*Insanity resulting from Anæmia.* By Dr. V. KRAFT-EBING. Irrenfreund, Nos. 4, 5, 1871. (Psychiatrisches Centralblatt, 25 Juli, 1871.)

The writer presents a case which he regards as an example of insanity having its origin in anæmia of the nervous centres. In his remarks he refers to a previous case, observed by himself, in which the patient, a subject of cardiac disease, with ascites, after each tapping

became insane, and at the same time manifested other symptoms of cerebral anæmia. He considers these appearances to have been occasioned by the removal of the pressure upon the abdominal vessels, and consequent anæmia of the brain; since, with the reaccumulation of the peritoneal fluid, the mental derangement and the other anæmic symptoms disappeared. The present case is very fully described by the writer; we give, however, a summary only.

Maria K., aged thirty-nine years, single, house-maid, came under observation June 23, 1865. There was no hereditary tendency to mental disease; patient was of a cheerful temperament, and had always been well cared for. Her development was tardy, menstruation beginning in her twenty-first year. In 1851 she had typhus fever, the cerebral symptoms being very severe, but there were no sequelæ. On June 2 (1865), she was attacked with violent peritonitis; fever was very great; venesection; thirty leeches upon abdomen. During the progress of the disease, which attained its height upon the seventh day, menstruation appeared, the loss of blood being very profuse; at the same time a copious hæmorrhage from the nose occurred. The combined effect of all these weakening circumstances (fever, antiphlogistic treatment, loss of albumen in the peritoneal exudation, loss of blood in the menstrual flow, and epistaxis) was, to produce a very great impoverishment of the blood, and we may refer the following events to this as their cause:

Upon the tenth day of the disease (and the third of the convalescence), June 12th, the patient was unusually lively, her vivacity and excitement increasing constantly; the following day there was considerable difficulty in speech and locomotion, high degree of mental excitement, great disturbance of consciousness, non-recognition of attendants, and delirium. In a few days she became the subject of fully-developed maniacal insanity. At the time of her admission into hospital this mental condition was unchanged. Her general state was most unfavorable—dry tongue, pulse 80, and very feeble, temperature normal, thoracic viscera normal, some peritoneal exudation. During the days immediately following her admission the patient was very violent; active delirium, with every possible kind of mental delusion, continuing almost without interruption. The treatment was confined to the regulation of the diet—strong beef-tea, eggs, red wine, etc. To overcome the existing sleeplessness, warm baths for three-quarters of an hour, and strong, old wine, were given, with most satisfactory results. At the end of five days, all of the above-described symptoms were still present, but their intensity was steadily diminishing. They had completely disappeared by July 4th, when the patient's intelligence was entirely restored, and the difficulty in speech and locomotion had vanished. She was discharged cured at the end of July, and there has been no relapse.

3.—*Absence of the Corpus Callosum in an Epileptic Idiot.* By Dr. MAX HUPPERT. Wunderlich's Archiv., 3 Heft, 1871. (Psychiatrisches Centralblatt, 25 Juli, 1871.)

The patient, fifty-seven years of age, an epileptic idiot, died of ascites caused by a cirrhosis hepatis. At the autopsy it was found that

the site of the corpus callosum and septum lucidum was occupied by a mass of connective tissue; upon which, in front, the anterior pillars of the fornix touched, while the corpora fimbriata, which terminated in very thin, whitish, irregularly-filamentous layers, rested upon its posterior borders. This perforated, gauze-like mass was of a bluish-white color, firm and tough, composed of sinuous bundles of connective tissue—no blood-vessels nor nerve-filaments being recognizable. The fornix likewise, between the two points above referred to, was wanting. The writer does not regard this as a case of arrest of development, but considers it to be the result of a disease, causing the destruction and disappearance of the corpus callosum, which began at a time when the development of the three commissures at the base had progressed very far—possibly even when they had attained their full development. He arrived at this conclusion, from having observed that the three commissures, or at least the middle one, was of normal size.

A high grade of hydrocephalus congenitus was present, which may have begun toward the end of gestation, and to which the atrophy of the corpus callosum may have been due. Upon this supposition, however, the possibility of referring special symptoms to the absence of the corpus callosum is taken away—because the atrophy of the hemispheres, occasioned by the hydrocephalus, explains the idiocy, and epilepsy may succeed to this affection of the nervous system. If we consider that the corpus callosum serves to unite the ideas which are supposed to originate in each hemisphere at the same moment, and are identical, the case of this idiot fails to furnish us with any conclusions which would be of value in this respect.

4.—*A New Narcotic.* By Dr. LIEBREICH. Wiener medizinische Zeitung, No. 45. (Psychiatrisches Centralblatt, 24 November, 1871.)

Dr. Liebreich, in a paper read before the *Naturforscher Versammlung*, directs attention to the importance of constantly bearing in mind, in experimenting with medicinal substances, the elemental chemical constitution of the substances employed. And this is especially necessary when substances which undergo decomposition in the organism are used. Chloral and ethylene alcohol have the same action as the trichloride group (i. e., as chloroform), and the question arises, whether aldehyde, acted upon by chlorine (gechlorten Aldehyde), (in case this compound should become known), would have precisely the same action as the trichloride group. Krämer and Pinner have produced a *crotonate of chloralhydrate* (Crotonchloralhydrat), by the action of chlorine upon allyl—which compound, treated with alkalies, decomposes into the dichloride of allyl and formic acid, hydrochloric acid being given off.

The effect of crotonate of chloral upon animals is different from that of chloral, although the former contains likewise three atoms of chlorine united with carbon. The first result, in experimenting upon animals, is a profound anæsthesia of the brain, the sensibility of the remainder of the body being retained. In the second stage, loss of function in the spinal cord occurs, characterized by entire absence of

reflex excitability. The pulse and respiration are unaffected. If the dose be increased, death results in the third stage, from paralysis of the medulla oblongata. The animals may be kept alive by means of artificial respiration, because the crotonate of chloral does not affect the heart's action, while chloral causes paralysis of the muscles of the heart.

That death is due to paralysis of the medulla oblongata, is demonstrated by the fact that, so long as artificial respiration is kept up in animals under the influence of this substance, galvanization of the pneumogastric nerves at their origin is not followed by contraction of the diaphragm; while this result does follow upon irritation of the phrenic nerve. Nor does the diaphragm respond to irritation of the pneumogastrics in animals which have been saved by artificial respiration, i. e., are able again to carry on independent respiratory movements. The theory of the action of this substance seems to be that the dichloride of ethyl is formed in the organism, and this acts in a manner similar to the chloride of ethyl (whose *modus operandi* Liebreich has already explained). That the undecomposed crotonate of chloral is capable of acting upon the organism, is seen when animals are poisoned by large doses of it; for, in these cases, contrary to what is described above, paralysis of the heart takes place. After the *modus operandi* of this substance upon animals was understood, experiments upon the human subject seemed to be inadmissible. Liebreich, in the clinique of the Berlin University, was the first to attempt them. Complete anæsthesia throughout the course of the trigeminus in a child was produced, the reflex excitability of the remainder of the body continuing unaffected; pulse and respiration unaltered. More recent experiments upon patients with mental disease gave similar results; and it is demonstrated that, in the crotonate of chloral we possess a means of bringing the brain into a state of profound anæsthesia, without interfering with the activity of the rest of the body; while, with the chloral, the correspondingly deep narcosis of the brain is accompanied by a loss of sensibility throughout the entire organism, and by a dangerous depression in the heart's action.

5.—*Experiments and Reflections upon Intracranial Pressure.* By Dr. F. PAGENSTECHER. Heidelberg, 1871. (Psychiatrisches Centralblatt, 24 November, 1871.)

The basis of this treatise is founded upon the results of experiments made by Leyden, "Ueber Hirndruck und Hirnbrwegungen," published in Virchow's Archiv, Band 37. Pagenstecher was able to verify only in general the statements of Leyden, which experience had already occurred to other authors (*vide* Leidsdorf and Stricher, *Injectionversuche an Hirnen lebender Thiere*. Vierteljahrschrift für Psychiatrie, 1867.)

Leyden directed his attention particularly to the amount of pressure exerted by the injected fluid (a weak solution of chloride of sodium, or albumen). Pagenstecher experimented with reference to the quantity of fluid exerting the pressure, and its proportion to the contents of the cranial cavity. For this purpose he employed a sub-

stance which could not be absorbed—ordinarily a mixture of tallow and wax, melting at 50° C. The injection was made between the bone and dura mater, by means of an apparatus similar to Leyden's. Of the twenty-six animals operated upon, only three died from encephalitis, or meningitis, caused directly by the injection; and two others, after a fresh irritation to the brain, made in removing the injected mass. In the cases of the remaining animals which died, no inflammatory symptoms were present. The gravity of the symptoms did not depend alone upon the quantity of the injection; a large quantity localized would exert a much more marked influence upon the deeply-seated nerve-centres than a much greater quantity spread out in a thin layer over a more extended surface. Complete recovery took place very rapidly, when life was not destroyed by the compression. The maximum quantity of fluid, which could be injected without occasioning symptoms of compression, amounted to 6.5 per cent. of the contents of the cranial cavity (which, in the human subject, is about 90 cubic mm. or 4 oz. of blood).

Without entering into the details of the experiments, the following are the principal points noted (as compared with those of Leyden):

1. *Pain* was caused (contrary to Leyden's experience) at the moment of the operation only, after which, usually, the animals manifested no signs of suffering. Therefore Pagenstecher lays stress upon the sensibility of the dura mater; and, although he does not consider it to be very great, he denies any sensibility as existing in the pia mater, or in the substance of the great hemispheres.

2. *Disturbances of Psychical Functions*.—A certain degree of stupor, and great apathy, attended with somnolence, were very often observed. Sopor and coma, when present, were indications of an unfavorable termination.

3. *Motor Effects*.—Almost always when the injection was being made, but only at that time, violent epileptiform convulsive movements were observed, consisting in opisthotonos and contractions of the extensor muscles of the extremities (the masseter muscles not being involved). Pagenstecher regards the convulsions as due to the sudden increase in the amount of intracranial pressure, and asserts that they would likewise appear upon sudden diminution in the amount of pressure. Clonic spasms were noticed upon the side of the operation in three cases, and once upon the uninjured side, and, in one case, rolling movements, confined to the uninjured side.

4. *Appearances in the Eyes*.—Dilatation and immobility of both pupils were present, especially when coma existed. Once the pupil upon the operated side only was dilated. Momentary contraction of the pupils was occasionally seen. Once a keratitis was produced.

5. *Effects upon the Pulse, Respiration, and Temperature*.—Pagenstecher, in accordance with Leyden's experience, but only in the severer cases, noticed that, at first, there was a diminution in the frequency of the pulse, followed very quickly by a greatly-increased frequency. The same thing was true of the respiration, whose curve (given in Table 3) corresponds pretty accurately with that of the pulse. As a rule, the temperature, immediately subsequent to the

operation, fell about $\frac{1}{2}^{\circ}$ C., but soon returned to the normal, if no indications of very severe compression existed. Where the compression was very great, the temperature fell gradually but uninterruptedly.

It seems reasonable to expect that these experiments upon dogs may be turned to account in the diagnosis of diseases in the human subject, where symptoms of cerebral compression are present.

6.—*Experiments upon Intracranial Pressure, and upon the Cerebral Circulation.* By Dr. F. JOLLY, Würzburg, 1871. (*Psychiatrisches Centralblatt*, 24 November, 1871.)

The means used in estimating the intracranial pressure were modifications of those employed by Leyden. The normal pressure within the brain (which is less during inspiration and greater during expiration) is inconsiderable, and may even be diminished by the pressure of the atmosphere. We possess two methods by means of which to ascertain how variations in the pressure, residing in the circulatory apparatus, influence the intracranial pressure. We may inject, under a known degree of pressure, any fluid directly into the vessels of the brain; or, we may resort to experiments which produce an effect upon the pressure of the blood. (In employing the first method, the blood of the same species of animal is the only fluid to be used, whose influence would be entirely neutral; and yet $\frac{1}{4}$ per cent. of chloride of sodium is not to be discarded as altogether useless, since the excitability of the nervous centres is not so quickly destroyed by it as is generally supposed. The signs of irritation, produced by interruption in the flow of blood to the brain, cease only when the circulation in the spinal cord is interfered with as well; and since this was the case in the experiments of Nasse and Rosenthal, the pernicious influence of the solution of chloride of sodium has been over-estimated.)

Each increase of pressure in the arteries or veins which supply the brain produces a considerable increase in the amount of intracranial pressure. Compression of the carotids is of little moment, and is followed by slight diminution of pressure; after compression ceases to be made, the pressure is somewhat increased, but very soon returns to the normal standard. This is readily explained, for, when a less quantity of blood flows through the carotids, the quantity in the jugular veins must necessarily be diminished. The increase in the amount of intracranial pressure, caused by interfering with the return of blood from the brain (i. e., by compressing the jugular veins), seems to be somewhat greater than the decrease when the arterial supply is interrupted.

Irritation of the sensitive nerves, as is known, produces an increase of arterial pressure; yet the increase of intracranial pressure, after such irritation, could be referred only in small part to the variation in the pressure in the circulatory system, because the former failed only in slight degree in experiments where artificial respiration was practised upon animals under the influence of wourara. The principal portion of this increase of pressure must therefore be due to the influence of respiration.

A series of experiments, in which the vessels of the brain (under the conditions described above) were observed through a piece of

glass inserted into an opening made in the skull by trepanning, revealed, among other results, the remarkable fact that the current of blood, entering the brain through one carotid, is comparatively independent of that upon the opposite side; and that it is therefore possible to have an hyperæmia of one hemisphere alone.

Experiments upon animals dying by suffocation showed that the effect of changing the character of the respiration, by closing the air-passages, consists (so long as life remains) in a considerable increase in the amount of cerebral pressure, and in hyperæmia, and only when life becomes extinct do these diminish; the latter giving place in a short time to complete anæmia.

7.—*The Artificial Production of Epilepsy in Guinea-pigs.* By Prof. C. WESTPHAL. (Psychiatrisches Centralblatt, 24 November, 1871.)

In connection with the experiments of Brown-Séquard, for the purpose of producing epilepsy in Guinea-pigs by section of the spinal cord or of the sciatic nerve, Westphal has pursued the subject still further, and has occupied himself with the question, if it be not possible to originate the same condition by means of certain injuries limited to the integument alone. If a Guinea-pig be struck upon the head with a certain amount of force, convulsions similar to those caused by section of the spinal cord ensue. Should the blow be not too violent, the animal quickly recovers from its effects, and seems to be entirely well. In the course of a few weeks, however, the same "zone épileptogène," described by Brown-Séquard, is noticed, i. e., there exists upon the lower jaw and neck a region, the *zone épileptogène*, which, when irritated by pressure or the knife, gives rise to epileptiform convulsions. If the time requisite for the complete development of this condition have not elapsed, we find a stage in which only imperfect convulsive movements follow upon irritation of the *zone épileptogène*, merely twitchings of the fingers, eyelids, etc.

Westphal confirms the statement of Brown-Séquard, that these epileptic manifestations are observed in the offspring of the injured animals.

As a possible anatomical foundation for this condition, small hæmorrhagic spots were always found in the medulla oblongata, and in the upper cervical portion of the spinal cord, in Westphal's cases, especially in the latter location.

No experiments, exactly analogous to these, or to those of Brown-Séquard, have been made upon men, and Westphal maintains that the existence of spinal epilepsy has not been proved. On the other hand, two cases are noted in which, even in the human subject, something similar to the *zone épileptogène* was observed. In the case of an epileptic boy, Westphal was able upon three occasions to bring on convulsions by pressure upon the face. The second case (which was interesting in many other particulars) was that of a girl, in whom convulsions were always produced when pressure was made upon the N. supra-orbitalis sin. at its point of emergence from the supraorbital foramen. After excising a portion of the nerve (3 cm.), it was no longer possible, by pressure, to occasion the attacks, though they continued,

as before, to occur spontaneously. It was remarkable that the sensibility of the integument supplied by the excised nerve was not lost, but only the ability to accurately localize the seat of sensation was diminished. Westphal, with reason, proposes the question whether these attacks, artificially originated in Guinea-pigs, are to be considered as identical with the epileptic convulsions which occur in the human subject.

8.—*An Essay upon the Mode of Origin and Development (Mechanik) of the Psychical States.* By Dr. LANGWIESER, Assistant-Physician in the Landesirrenanstalt, zu Ybbs. Wien. Verlag von C. Czermak. (Psychiatrisches Centralblatt, 25 Juli, 1871.)

The writer starts with the assertion that the interrogation of our self-consciousness is insufficient to yield satisfactory conclusions in regard to the nature of the mental states. If we desire to arrive at the real essence of these states, we must confine ourselves, in our observations, strictly to the acts of the mind themselves. When we have taken cognizance of any mental action, we must inquire by what mechanical means we can originate a like action. Many kinds of aids are within our reach; and the question arises, How we may obtain possession of the multitude of mechanical aids, and how we are to decide upon the proper agency to be employed. By this it appears that our organism possesses the capacity to learn to appropriate to itself skilfulness; that, for the display of this skilfulness, a single psychical impulse only is necessary; while, without this skilfulness, any series of movements would require as many distinct impulses of the will for their accomplishment as the series is composed of elements. Skilfulness is acquired by practice.

In explanation of the coördination of several movements, we must admit that the central origins of the nerves, which in any combined movement are brought into play, are brought into an opposed coördination, and thereby are devoted to the formation of a central apparatus for a definite motor effect, to the establishing of a special organ of "skilfulness." This apparatus is a uniform creation. The human organism develops other advantages similar to this acquiring of skilfulness, in that it furnishes itself with special receptive apparatuses, for the receiving of irritations from the outer world, acting through the organs of special sense. It is the duty of these receptive apparatuses to bring a certain number of scattered impressions into a uniform combined action. This coördinating is their proper work. They receive the first impressions, arrange them, and transmit them to the corresponding motor apparatuses. Between the receptive and motor apparatuses of transmission the process of reflection comes in. The organism is continuously enriching itself with such apparatuses for the reception and transmission of its central excitations. The systematizing of these apparatuses is accomplished by the avoidance of all circumventions and unnecessary repetitions of the same impulses transmitted through the nerves. Through this systematizing these apparatuses become developed into *perceptive* apparatuses, and their motor effect is the formation of words.

If the selection of the comprehensive faculty, as is necessary, must follow in the interest of the organism, then the organism must appropriate every thing which is under the control of the central nervous processes to itself, to the interests of its self-sustentation. The organism accomplishes this in the following manner: The receptive apparatuses show themselves in many instances to be insufficient and defective; therefore the transmission of the received impulse is imperfect, and the state of excitation of the central organs is unreliable. Had we now a special organ, which might be affected by these very uncertain movements of excitation, and would employ intelligibly these internal conditions, this organ would be the "organ of subjectivity" of the organism. Such an organ would not be affected by external irritations, but only by vacillations in the state of excitation of the central organs. Its reflex influence would likewise not extend back to a direct interference from without, but to a restraining or secondary influence upon the processes going on in the central organs.

The organ of subjectivity (Subjectivitätsorgan) must always make its decisive influence felt, so as to produce a quieting of the central excitations. Thus the connection with the needs peculiar to the organism is established, and the perceptive processes are brought into relation with the subjectivity, i. e., are raised into consciousness. If the necessary irritation is wanting in the organ of subjectivity (i. e., the vacillations in the state of excitation), its function is interfered with—thus *sleep* is caused; if the processes taking place in the perceptive apparatuses fail of the regulating influence of the organ of subjectivity, *dreams* result. The diseased processes, taking place in the waking state in the perceptive apparatuses, when a momentary interruption of the regulating action of the organ of sensibility occurs, are *hallucinations*.

For a closer examination of the conditions under discussion the essay itself must be consulted.

9.—*Compression of the Par Vagum to produce Asthenia and Anæsthesia in Surgical Operations.* By A. WALLER. (Allg. Wiener Med. Zeitung, 1871, 9.)

All of the phenomena which are seen in the lower animals under the influence of the galvanic current, or other excitant, may be produced in the human subject by means of pressure upon the cervical portion of the pneumogastric nerves. The sensations resulting from the compression, can be properly appreciated by the physician only by experimenting upon himself, or upon some person competent to describe accurately what he experiences. And only in this way can we arrive at just conclusions as to the part which these nerves with their principal branches play in those imperfectly-understood affections of the larynx, lungs, heart, and stomach, in which at present we are able only theoretically to refer to the par vagum as the original seat of the disease, without being in condition to demonstrate the point by actual experiment. In addition to its importance as a means of diagnosis, pressure upon the pneumogastric has also a therapeutical value in several affections of the nervous system. (The ancient Assyrian

ians made use of it with advantage, and Aristotle describes graphically the symptoms it produced.) Waller employs it in cases of hysteria and in epilepsy. His patients, when moderate pressure is made upon both nerves, fall to the floor as though "struck by lightning;" all the voluntary muscles become relaxed, all sensation ceases, but very quickly the power of motion and sensation returns, and for a short time only does a feeling of weakness and *malaise* remain. He divides, for practical purposes, the symptoms of the compression into two classes, those of asthenia and of anæsthesia. The asthenic symptoms, which, in their fullest development, exhibit the loss of all voluntary power, present various intermediate degrees of muscular weakness. Almost always a certain amount of weakness follows every compression of the pneumogastric, which seems to be due to the influence exerted at the same time upon the medulla oblongata, and is recognized especially by decrease in the heart's action, and in feebleness or loss of pulsation in the carotids.

In the reduction of dislocations, this compression offers advantages which it is impossible to obtain by any other known means, among which are: the fact that no bad results follow its employment, it is always at hand, its readiness of application. Waller cites the case of an athletic young man with dislocation of the os brachii forward, under the clavicle. After several fruitless attempts at reduction, chloroform was sent for, but, before its arrival, compression of the par vagum was tried. After two or three minutes the carotid ceased to beat, and at the same instant the reduction was effected. The harmlessness of this method of producing anæsthesia, as compared with that of chloroform, is a strong point in its favor. While death from chloroform is not unknown, compression of the pneumogastrics never endangers life, nor is any instance mentioned where prolonged disturbance of muscular excitability has followed its use. Waller strongly recommends it in all short operations, and mentions especially dislocation, extraction of teeth, and removal of dead bone.

PREPARED BY DR. S. G. WEBBER, OF BOSTON.

10.—*Influence of Rheumatism on the Character.* DR. FAURE. (Archives Générales, September, 1871.)

Rheumatism is manifested under such variable forms that we may inquire, on meeting any thing unusual in a patient subject to its attacks, whether rheumatism may not be concerned therein. Why may it not attack the organs of the cerebral functions on which character depends, as well as the heart, etc.?

Cerebral rheumatism has been long recognized, with its attendant febrile and inflammatory phenomena. It is not of that I wish to speak, but rather of cases where it acts on the whole assemblage of mental faculties. It is a change in the individual, which for a time separates him from his normal habit of thought and feeling; they seem as usual, but are themselves aware of a change.

A man who is subject to rheumatism will very often tell you, if you ask him—for he has no reason to refer what passes in his mind to the sensations in his arms or legs, or elsewhere in his muscular system—that he has moments of despondency without cause, of inquietude, of forlornness, inexplicable to himself. Then he is discouraged without cause, and sees every thing in the shade; that which ought scarcely to be the object of a slight care, becomes the cause of a cruel torment, he is without force, his thoughts can be fixed on nothing, all intellectual work is impossible; if he wishes to solve a problem, he soon experiences fatigue and heaviness of his head, which often turn into a violent headache; then his sensations are altered, his affections cease, he is indifferent to every thing; that which has the most right or power over his mind, remembrances which are most dear or most painful, have no interest for him. His character has changed. He is conscious of his condition, and can for a few minutes rouse himself out of it. A crisis may follow, his head is congested, he feels quite giddy. Finally, all these symptoms disappear, and his mind recovers its tone and clearness. The attacks vary much with individual disposition.

Sometimes the rheumatic attacks are very slight, or are altogether wanting, or the above-mentioned attacks may occur during the interval between the rheumatic attacks.

These attacks follow the same causes as true rheumatic attacks, are variable like the latter, and remittent or intermittent.

The particulars of the cases of three physicians and several other persons thus affected are given.

11.—*The Artificial Production of Epilepsy in Guinea-pigs.* Prof. C. WESTPHAL. (Allg. Med. Cent. Zeitung, 98-100, 1871.)

First is given a review of Brown-Séguard's experiments, that, by dividing one-half the cord in Guinea-pigs, after some weeks, irritation of the cheek causes epileptiform convulsions. The epileptogenous zone is the side of the face below the eye, the skin on the lower border of the lower jaw, on the anterior border of the shoulder-blade, and also a part of the skin of the neck. In this zone there is a diminution of sensibility. Division of the sciatic nerve causes the same phenomena. When both sides of the cord or both sciatics are divided, the epileptogenous zones are found on both sides. The author has found the above to be true. He has also found that when he gives a Guinea-pig a blow, or several blows, on the head with a small hammer, holding the head firmly on a support, or when the animal's head is beaten against a hard substance, there follows an attack of convulsions of exactly the same character. The attack occurs immediately, or from a few seconds to a minute after; then the animal jumps up as lively as ever, or it may lie on its side without making any voluntary movement after coming to. Then it walks with its body curved, in a bow shape; there may also be weakness of the anterior legs, lasting a few minutes. If the blows are too strong, death follows from cessation of respiration, the heart continuing to beat some four to five minutes longer. Artificial respiration may restore life. There is then exalted reflex irritability, and the animal, while lying on its side, makes the motion of running. Some-

times, after a few seconds, the respiration returns spontaneously, and sometimes it is only lengthened, and after a while recovers its ordinary condition.

After a few weeks, the animal having meanwhile entirely recovered its activity, upon pinching the epileptogenous zone of either side, especially the lower surface of the angle of the lower jaw, there occurs an attack perfectly analogous to those produced in animals operated upon according to Brown-Séquard's method. Before the complete establishment of this condition, a pinch on the above-mentioned zone will cause a partial attack, as will also a series of scratching motions applied to the cheek and neck.

If the irritation is applied repeatedly, the attacks become less and less severe, and, finally, are scarcely to be noticed.

The epileptic condition may set in when the blows are so light as not to cause convulsions immediately. Four to five weeks are necessary for the development of the full epileptiform attacks, though the difference in different animals is very great. The condition giving rise to epileptic attacks continues from six or eight weeks to six months or more, then gradually subsides and is lost. By one female Guinea-pig the epileptic tendency was transmitted to her young, which could be thrown into an imperfect attack by irritating the epileptogenous zone.

As to the cause of this condition, it could not be by reflex action of the injured skin or periosteum, for, when he removed both and struck the exposed bone, the attacks followed in the same manner as in uninjured animals. Autopsies, made immediately after experiments which had succeeded in exciting convulsions, showed a moderate amount of effusion under the skin without injury to the skull; the cerebrum and cerebellum, the crura cerebri, pons, hippocampus major, and ventricles, were without any constant lesion. There were, however, *constantly* found in the medulla oblongata, or the upper cervical portion of the cord, very fine, small hæmorrhages, from the size of a fine point to the size of a pin's-head, irregularly scattered through the gray and white substance. Sometimes these lesions were found lower in the cord, even as far as the dorsal region. Usually there was also blood in the sac of the dura-mater spinalis, and more rarely at the base of the brain.

12.—*Paralysis after Diphtheria.* V. KRAFT-EBING. (Deutsches Arch. f. klin. Med., 1871.—Allg. Med. Central Zeit., 99, 1871.)

A. K., aged thirty years, attacked October 2, 1869, with diphtheria. On the 8th appeared paralysis, with difficult deglutition, nasal speech, strabismus, imperfect accommodation for near objects, which extended in two days to all the extremities except the forearms. Cutaneous and muscular anæsthesia was present; no pain. The paralysis gradually disappeared from the periphery toward the centre, but yet the paralyzed muscles became emaciated and began to recover their normal size only in January. The sensibility and power of motion returned in the right side first, and then in the left.

In March, 1870, the author took charge of the patient: great emaciation of the muscles supplied by the crural, obturator, and glutei

nerves. Cutaneous sensibility restored. Adduction and abduction of the thigh, inward and outward rolling of the hip-joint almost absent. He could not rise from a sitting position without the aid of his hands, and could not hold his extended leg suspended. On active and passive motion clonic cramp occurred in the paralyzed muscles. In the right leg was still some weakness, without disturbance of the nutrition, and the electric irritability was normal. In the left the indirect irritability for galvanic and faradaic current was normal, but the faradaic contractility of the muscles was lost; the galvano-muscular contractility was nearly normal, the AnS acted more powerfully than the KaS. On mechanical irritation, the affected muscles did not act.

By electrical treatment the patient was restored.

The author thinks this case gives support to Buhl's idea that in such cases the paralysis is caused by exudation at the roots of the nerves, which by compression causes the paralysis, and as the exudation is absorbed the normal action returns; but, if it is not absorbed, the paralysis persists.

13.—*Treatment of Tetanus among the Chinese.* SCHRIMPTON. (Gazz. Med. Ital., Lomb., 1871.—Allg. Med. Central Zeit., 99, 1871.)

This mode of treatment of tetanus has been seen by English physicians in China and India to be successful: The patient smokes in a pipe a mixture of from twenty to twenty-five centigrammes of crude opium and tea- or rose-leaves, which are worked up with a small quantity of molasses. When smoking, he must inspire as deeply as possible, and continue this operation until the narcotic influence is noticed. This continues then, as a rule, three or four hours. The smoking is repeated as soon as the tetanic symptoms reappear. In the mean time, as much nourishment as possible is given. In using opium thus, it must be remembered that its narcotic effect is somewhat neutralized by tobacco.

14.—*Acephalocysts of the Brain.* REEB. (Recueil de Mémoires, etc., 1871.—Centralblatt f. d. Med. Wissensch., 1, 1872.)

A boy, with chorea of left side and loss of vision, was received into the hospital at Múduah. A tumor appeared on the left side, in the parietal and temporal region. Muscular weakness, contraction, and epileptic attacks followed. At the autopsy, on dividing the scalp, the tumor bulged out from between the edges of the incision, forming a cyst surrounded by a sac of connective tissue not thicker than one millimetre. Within the cyst were a considerable quantity of clear, odorless liquid, and some young cysts. Nothing is said about finding the head of an echinococcus. The whole cyst was made up of four sacs communicating with each other by several narrow openings.

Another case is given in a boy eighteen years old, in which the cyst occupied the space usually filled by the right hemisphere, which had been destroyed, and its remains clothed the outer surface of the cyst with a thin layer of cerebral substance.

15.—*Hysterical Contraction.* CHARCOT. [Reported by BOUEN-VILLE.] (*Gazette des Hôpitaux*, 140, 1871.)

A. E., aged forty-two years, had left hemiplegia for twenty years, the left arm being rigidly semiflexed, the left leg extended in an unnatural position, the foot being in the position of extreme equinovarus; the adductors were also strongly contracted; all the joints were so rigid that, taking hold of the foot and lifting, the leg was raised like a stiff bar and elevated the lower part of the body also. This attitude of the limb is worthy of note, for it is a position rarely found in hemiplegia dependent upon foci of cerebral lesion, but is common in hysterical contraction. In the latter class of cases permanent flexion is exceptional.

The contraction persists during the most profound sleep, and there are neither daily exacerbations nor remissions; but chloroform produces instant relaxation. Though the contraction is of nearly two years' duration, the nutrition of the muscles has not materially suffered, and the electric contractility is nearly normal. Forcible flexion of the foot produces convulsive trembling, persisting sometimes a long time; this is present in paralysis with contraction due to organic spinal lesion when the lateral columns are in a state of sclerosis, but it is also found in hysterical contraction terminating in cure. The attack began suddenly with loss of consciousness. In all these respects the case resembles one due to organic cephalic lesion.

It differs from such and resembles hysterical contraction, because:

1. There is no facial paralysis, and the tongue is protruded straight;
2. There are analgesia and anæsthesia, as it were complete, occupying the whole half of the body corresponding to the paralysis, implicating the face, body, etc., affecting not merely the skin but also the muscles and perhaps the bones, exactly limited to the median line. This generalization of the anæsthesia to one side of the body, head, and limbs—this geometrical limitation by a vertical line, belongs properly to hysteria; it is never observed in hemiplegia from cerebral cause, and in spinal hemiplegia is found only on the side opposite the motor paralysis.
3. Her history points to hysteria as the cause. The disease began at the age of thirty-four years, after severe moral shock, by an epileptiform attack, followed by others, some epileptic, some hysterical, and at forty years the present symptoms appeared under the following circumstances: *a.* The catamenia, previously regular, became deranged; at times there was hæmatemesis; the abdomen became tympanitic, with severe pain on pressure over the left ovary; the pain was of a special character, accompanied with peculiar sensations radiating toward the epigastric region, which had preceded most of her attacks. *b.* About the same time there was persistent retention of urine, requiring the use of the catheter. *c.* Things were thus, when in October, 1868, there was a very severe attack, with convulsions, a condition resembling an apoplectic state. *d.* Stertorous respiration, and then the hemiplegia began.

This tympanites, these pains in the ovarian region, this retention of the urine, are not noticed as prodromes of hemiplegia from cerebral cause, but are found to precede the appearance of the permanent phenomena of hysteria.

e. The contraction began in the lower extremities ; in hemiplegia from cerebral cause it begins by preference in the upper. f. The contraction in the upper extremities began suddenly, whereas contraction after hemiplegia due to hæmorrhage or softening is slowly established in a progressive manner.

B. A., aged twenty-one, was attacked about two years since with permanent contraction of both legs, which remain rigidly extended. The muscular contractility is not diminished, the limbs are emaciated, but not more than may be due to obstinate vomiting. 1. She has had hysterical attacks ever since she was sixteen years of age ; 2. For four years she has had retention of urine ; 3. There is great tympanites ; 4. The ovarian regions are painful on pressure ; 5. The contraction occurred suddenly.

Will this contraction some day disappear, or will it persist indefinitely ?

A. Possibly, at some time not to be determined, a cure may be obtained suddenly ; from one day to the next all may return to the natural order. A moral emotion, an assemblage of events which should strongly affect the imagination, the return of the catamenia, are frequently the occasion of these sudden cures.

B. But the cure may not be obtained, the contractions may persist. In one case where the paralysis with contraction has continued sixteen years there is no hope of cure, the hysterical diathesis having ceased, but the affection remaining. In recent cases there is probably no change which could be recognized ; in old, inveterate cases there is probably sclerosis of the lateral columns, and this has been found once.

The lateral columns, or at least their posterior part, are the parts affected at first temporarily, which causes hysterical contraction ; finally, these modifications give place to more organic changes, a true sclerosis. In the present condition of science there is no symptom which can show that sclerosis has actually occurred.

Convulsive trembling of the contracted limbs, provoked, or arising spontaneously (*tonic spinal epilepsy*), a certain amount of emaciation of the muscular masses—a little diminution in the energy of the electric contractility—should not lead to despair of recovery. On the other hand, if the atrophy is limited more especially to certain groups of muscles, especially if joined with fibrillary contractions analogous to those observed in progressive muscular atrophy, and a very considerable diminution of faradaic contractility, it ought to be supposed that not only the lateral columns are seriously affected, but that, besides, the anterior cornua of the gray substance have been invaded.

Finally, the presence of organic spinal lesion would be certain if the rigidity of the limbs disappeared slowly or persisted during anæsthesia from chloroform.

16.—*Reflex Paralysis*. Dr. FEINBERG. (Berlin. klin. Wochenschrift, 41, 42, 45, 46, 1871.)

This name is given to paraplegias which depend upon affections of the genito-urinary organs, the uterus, the intestinal mucous membrane,

the external skin and other peripheral organs, without any organic lesion of the spinal cord. (The author then briefly reviews the history of the literature on this subject, and then continues.) Before going further, we must ask ourselves the following questions:

1. Are the cases published by the authors as reflex paralysis truly reflex in their causation, and of a purely functional nature?

2. Are there any diagnostic marks by which reflex paralysis can be distinguished from other paraplegias?

3. How can the existence of these paralyses be explained?

In many cases the reflex nature of the paralyses is not at all well proved, as Jaccoud shows, and the affection of the kidney or bladder was not the cause but the effect of the paralysis. Cases of paraplegia, depending on uterine affections, may, frequently, be due to mechanical pressure. In nearly all the cases where there have been autopsies, the examination of the spinal cord was not made with the microscope. The only case examined microscopically by Gull is imperfect, as the peripheral parts were not examined; and a case of Kussmaul's shows the value of this, as, in a case of paraplegia in the course of cystitis, atheroma of both hypogastric arteries and fatty degeneration of the sciatic nerves were found. Here was no reflex paralysis, but organic paraplegia from peripheral cause.

The diagnostic symptoms given by Brown-Séquard are mentioned; then it is remarked that the reflex paralysis cannot be properly referred to other than an affection of the cord, for, very often, disease of the cord is shown by derangement in peripheral organs, and besides, many causes may give rise to affections of the peripheral organs and of the cord, but the former are first noticed. The paralysis may occur suddenly, and paraplegia is not the only form; in sixteen cases, reported by Esnault and Vallin, both legs were affected six times—the left leg three times, right leg four times, right leg and right arm twice the left leg and left arm once.

The incomplete character of the paralysis is dependent upon the intensity of the spinal lesion; the recovery of such cases proves that the lesion was slight; the retention of reflex activity does not prove the functional nature of the affection, as this is retained even in organic lesions of the cord. The occurrence of urinary and intestinal disturbance may depend upon the fact that that part of the cord is implicated whence the nerves to the bladder and rectum start. Nearly all the cases of reflex paralysis which have ended fatally have been complicated at their beginning, during their course, or before their end, by disturbance of the urinary function. Those cases which have recovered, in which the latter was not present, depended probably upon hyperæmia of the cord, which may indeed affect the power of motion, but does not excite paralysis of the sphincters. The absence of pain in the back, hyperæsthesia, anæsthesia, formication, is not always noticed. When the spinal cord recovers its integrity, the affection supposed to be primary and the paralysis would both improve.

The discovery of inhibitory nerves seemed to render the theory of reflex paralysis tenable; but, as the existence of such nerves is not

settled, the existence of reflex paralysis cannot be proved conclusively thereby. The sudden paraplegia caused by Lewisson, by squeezing the kidney, uterus, or intestinal mucous membrane, is interesting; but it disappears immediately after the cessation of the pressure, wherein it differs from reflex paralysis.

Gull refers reflex paralysis to the extension of peripheral inflammation through the nerves of the cord. Remak considers it dependent upon sacro-lumbar neuritis ascendens, and Leyden has essentially the same views. To establish this more firmly, a series of experiments on rabbits was performed. First is mentioned a case of a man who had a tumor in the abdomen, bloody and purulent stools, and, some time later, weakness of the legs. Ascites was also present, which was relieved by puncture; yet the weakness in the legs continued and increased, and finally incontinence of urine and fæces appeared. At the autopsy the tumor was found to be a cancer, connected with the mesentery and intestine. The spinal cord in the lumbar region was found softened, the gray substance completely degenerated, without any healthy cells, the white substance much so, but partly intact. In the dorsal region the gray substance was degenerated, but the white was healthy, or nearly so.

A series of experiments on ten rabbits is given in detail. In all, one of the sciatic nerves was cauterized. Four survived, and the experiment was repeated on the other leg. The opposite leg became paralyzed; there was incontinence of fæces and urine. The nerve, between the point where it was cauterized and the cord, was intact, and no inflammation of the soft parts above the wound in the direction of the spine was noticed. In all the cases, however, the spinal cord was entirely degenerated through a longer or shorter extent, sometimes to the cervical region.

From these experiments it may be concluded that a strong irritation of a peripheral nerve may be communicated to the cord, and may excite myelitis, which attacks by preference the gray substance, extending in varying intensity to the white substance. The so-called reflex paralysis, probably in many cases, depends upon analogous causes; but the inflammation does not seem to always reach so high a degree.

In another experiment a stream of sulphuric ether was passed over the limbs of a rabbit for about thirty minutes. The temperature of the rectum sank from 38.4° to 35° C. Both legs lost motor and reflex power. After a while motion and sensation returned. For twenty-one days there was no marked change; then the epidermis was loosened and came off; forty-one days after, there were incontinence of urine and paraplegia, and the animal died.

The spinal membranes were injected; the substance of the cord was softened in its entire length; the softening and degeneration affected both gray and white substance. The peripheral nerves were not examined.

Cases reported by Walford, Oppolzer, Frerichs, and Valentiner, show a similar effect of cold upon the spinal cord.

The following conclusions are derived from the experiments: In all the cases observed, the beginning of the lesion of the cord was shown

by incontinence of urine, therefore indicating lesion of the lumbar part, which extended gradually to the entire cord. In many cases the cervical portion was unaffected, or only in part changed. In slowly-progressing cases, where the animal lived many days after the paralysis of the bladder, complete paraplegia could be noticed. In rapid cases, immobility and apathy were most marked. The rapidity with which the disease spread, from the periphery to the centre, depended upon the intensity of the peripheral lesion. In many cases, where excessive inflammation and superficial gangrene followed severe cauterization, death occurred after forty-four, forty-nine, and seventy-eight hours, and the autopsy showed complete softening of the cord. In most of the cases the inflammation was moderate, suppuration was established, and death followed the spinal lesion respectively in thirteen days, nineteen days, thirty-nine, and seventy-five days.

17.—*A Contribution to the Study of the Causation of Aphasia.* Dr. TH. SIMON. (Berlin. klin. Wochensch., 45, 46, 49, 50, 1871.)

I designate as aphasia all those cases of disturbance of speech, in which the intelligence is preserved sufficiently to understand what is said, and in which there is at least a relative integrity of the mechanism of speech.

Of two persons with hemiplegic affection of the same limbs, both unable to make themselves understood, one may be aphasic, the other not. I have, in giving my definition of the word aphasia, intentionally employed the most comprehensive expression, "disturbance of speech," for it may be of many varieties. There may be present also indistinctness of speech, or the motions of the tongue may be free, and otherwise no paralytic symptoms may be present, and the patient may either not be able to speak at all, or only to speak single or several words, which do not correspond with his meaning, while, when the right word is used, he may signify that that is what he meant.

The author refers to the views of Dax and Broca, as to the importance of the third frontal convolution in aphasia, and then continues: "I have had numerous opportunities to see cases of aphasia, and in many of them to make the autopsy; and the conviction to which I have been led by my experience is the following: At all events, the seat of the disturbance of speech called aphasia is to be sought in the third frontal convolution, or in its immediate neighborhood, but not exclusively on the left side. Such a functional difference between anatomically corresponding parts of the right and left hemispheres would contradict all previous observation and experience; hence, it is to be accepted only with great caution, and upon the most convincing proof. Such a restriction to the left side I consider contradicted by the experiences of others as well as by my own. I believe, moreover, that both third frontal convolutions are related to speech, but that we generally employ the left, just as, for drawing, writing, and other purposes, we employ by preference the centres of innervation for the right hand, which also lies on the left."

If the centre innervating the right hand is destroyed, the person affected may learn to use his left hand, that is, may educate the right

side of his brain to do for the left hand what the left side had formerly done for the right hand; and, though the first efforts may be crude, finally, the left hand acquires the same dexterity with the right. The same is true of the centres of speech. When the one most used, generally the left, is destroyed, the right may be educated to take its place, and speech may be entirely recovered. This view is supported by recorded cases:

CASE I.—H., a man sixty-five years old, had long been treated for tertiary syphilis, and had for some time had slight weakness of the left side. Five weeks before his death the dragging of the left foot became more marked, and after a few days there was complete paralysis of the left upper and lower extremities. The right side of the face was paralyzed. Speech was perfectly normal, but he answered slowly; was demented. The paralyzed limbs were finally contracted.

After death the autopsy showed the right anterior and middle half of the cerebrum to be flatter and broader than the left, and the distended membranes gave a sense of fluctuation. The softening implicated the whole of the frontal lobe and the middle lobe, and affected the anterior part of the occipital lobe, so that only its posterior third was unaffected. The posterior cornu and the whole of the posterior half of the right corpus striatum were softened; in spots the ependyma to the posterior cornu remained. The lenticular nucleus and the white substance in its vicinity were entirely destroyed, also a large part of the optic thalamus. The anterior half of the corpus callosum was implicated in the softening. The cord showed secondary change on the left side.

Among other remarks the author says: "3. In reference to aphasia, this case shows that complete destruction of the right anterior lobe is without effect upon the speech."

I mention next two cases which seem to prove that affections of the left third frontal convolution are also without influence upon speech. I say seem, for a careful analysis of the third case will lead to other conclusions.

CASE II.—A woman, seventy-five years old, of whom nothing could be learned, was brought to hospital, paralyzed on the left side and unable to walk; so far as her dementia would allow of speech, she spoke well, mentioned her name and the names of the persons about her, until her death at eighty-three years. After removing the meninges, the following centres of softening were seen: 1. The largest, in the right posterior and middle lobes, beginning at the convolution bordering the fossa of Sylvius, passed through the fossa to the second and third parietal convolution, and from there to the second occipital convolution, which was almost entirely destroyed. 2. In the second convolution of the posterior lobe on the left was a centre, whose largest diameter was about two centimetres. 3. In the convolution bordering anteriorly the fissure of Rolando, just above where the second frontal convolution passes into the central convolution, was a softening which passed the fissure of Rolando, and extended to the posterior central convolution. 4. In the left third frontal convolution was a spot 2.5 centimetres large, completely softened. The softening began about 2.4

centimetres from the fissure of Rolando. A fifth centre of softening was found on cutting the brain on the surface of the right corpus striatum, implicating also the optic thalamus and the lenticular nucleus.

CASE III.—Hans H. H., aged fifty-five years, on awaking from an afternoon nap, could not speak, though he understood every thing which occurred, or which was said. The right arm was entirely paralyzed, the right leg imperfectly. After four days he could speak again slowly and drawling, but used the right words.

After death, the third frontal convolution and the upper part of the second were found softened, and almost entirely destroyed.

Though these two cases are opposed to the theory—for speech was not lost though the left-third frontal convolution was destroyed in each case—yet aphasia was present for a while in the third case, so much so, that his neighbors noticed it. But the power of talking returned, though the destruction of the third frontal convolution persisted. Most naturally we may suppose that the right convolution supplied the place of the one destroyed on the left.

The same may be supposed to have been the case in the second, as no history could be obtained. Also in cases of destruction of the left convolution by pressure as of a tumor, the destruction is so slow that the right side can gradually supply the place of the left.

The next case speaks strongly in favor of the third convolution being the seat of the organ of speech.

CASE IV.—A man, thirty-five years old, after several days' unrest, loss of sleep, and trembling of the hand, had a severe attack of delirium tremens; there was no loss of speech; he died suddenly. The left isle of Reil and the anterior part of the first temporal convolution were entirely destroyed, the portion between the isle and the third frontal convolution was also destroyed, but the third frontal convolution was not affected. The destruction reached inward to the outer half of the corpus striatum. There was pneumonia of the lower half of the upper lobe, of right lung, and of the lower lobe.

The delirium tremens was thought to be dependent upon the lung-disease, and not upon the cerebral disease, which was of old date.

CASE V.—A woman, sixty-eight years old, had suffered for a few days from distress in the chest. After sudden loss of consciousness, lasting only a short time, she could no longer speak, though she understood what was said, and tried to make herself understood by signs. There was no paralysis of the limbs, though the right side of the face was slightly affected. She died from intercurrent disease of the lungs. The vessels at the base were very atheromatous. In the frontal convolution bordering the fissure of Sylvius (in the third, consequently), were capillary apoplexies in the cortical substance, forming a group about one centimetre in size, where the gray substance was almost completely destroyed. There was no other disease of any portion of the brain.

The slight facial paresis is perhaps without other significance than as a "neuropathic" symptom, and was discovered because an effort was made to find some motor disturbance to help explain the loss of speech. Except this paresis, the case is one of unusually simple

aphasia, and likewise the *post-mortem* appearances are extraordinarily clear and uncomplicated.

CASE VI.—J. N. H., aged seventy-three, received into hospital with the diagnosis "apoplexy." Pulse slow. Substitution of one word for another, with aphasia. *Left hemiplegia*. Death from disease of the lung. This was considered during life to be a case which disproved the theory of aphasia being caused by disease in the left side of the brain. There was found pachymeningitis; the right temporal lobe was almost entirely softened; also the third frontal convolution at its posterior part near the fissure of Sylvius, throughout its entire breadth, and for about 1.5 centimetre of its length, was softened. The rest of the left anterior lobe was free from disease.

CASE VII.—A strong man, twenty-three years old, fell with his horse while riding with others. He rose immediately, seized the bridle, and tried again to mount. A physician in the company went to him and found a small wound on the head, which penetrated to the bone, the latter being deeply depressed. On questioning him it was found that he could not answer a word, while by signs he showed that he understood perfectly what was said, and there was not the least sign of paralysis anywhere. The same facts were recognized on repeated examinations subsequently. Afterward he could speak single words, as, for example, *Wasser*, but used it promiscuously for all other words. Gradually delirium, facial paresis and finally paresis of the limbs appeared, and after three weeks he died. In the left parietal bone was a loss of substance, the opening being nearly pear-shaped, with a very small amount of splintering, without any fracture of bones, and with no signs of reaction. On the interior of the skull the loss of substance extends over a wider space, being nearly circular. Only a portion of the lost bone was found in the immediate vicinity of the fracture; a piece of bone, two centimetres wide, and one centimetre thick, being the upper end of the portion of the vitreous table which had been broken away, was found in the cerebral substance in the third left frontal convolution.

The third convolution, the surrounding portion of the second, and the isle, were softened, the softening extending deeply into the white substance. The central ganglia were normal. On the outer surface of the dura mater, around the hole in the skull, were products of inflammation.

The changes, other than the fracture and the splinter of bone in the brain, were secondary. The wound of the third left frontal convolution of a previously perfectly healthy man corresponded to an immediately appearing complete aphasia, and in so far I believe I am right in calling this case "almost an experiment made upon a human being." This observation has thoroughly convinced me that the seat of the disturbance called aphasia is to be sought in the third left frontal convolution, and, according to the statement made in the introduction to the observations, this view is to be rejected only when, in any case of complete destruction of both third frontal convolutions, speech is retained.

18.—*Condition of the Central and Peripheral Nervous System in Traumatic Tetanus.*—J. A. MICHAUD. (*Arch. de Physiologie Norm. et Pathol.*, 1, 1872.)

The nervous system was carefully examined in four cases of tetanus following wounds received during the last war. The spinal meninges was only once inflamed. The central portion of the cord was of a uniform red color, as if touched with a pencil dipped in carmine, the central gray substance being obscured. This injection extended throughout the length of the cord, into the medulla oblongata and even to the pons. The brain was always normal.

Microscopically, in the fresh state, there was an increase of nuclei in the white substance of the cord, medulla, and pons, not in the brain. On making section (of the hardened cord) there were found vascular lesion and proliferation of elements. The vessels had undergone great dilatation, especially in the gray substance, being sometimes two and three times the usual size, probably due to the commencement of inflammation. There was, then, an intense congestion and consequently increase of intra-vascular pressure. If the resistance of the vessels had been insufficient, there would have been rupture, and hence small hæmorrhagic foci, as seen by M. Joffroy. If, however, the vessels prove strong enough to endure the pressure, there would occur certain lesions which may be described as foci of exudation, observed by Lockhart Clarke, and described by him as patches of granular and semi-fluid disintegration. These are seen in the vicinity of vessels by the side of the central canal.

We do not agree with him as to their mode of production, for he thinks they are the result of destruction of nervous tissue; we think that, in tetanus at least, they are the result of an exudation of plasma from the vessels, that the exuded material separates the nerve fibres and interposes itself between them.

Two varieties of cellular elements are seen; the rounded nuclei, isolated or in groups, pertaining to the white substance, are observed in the dorsal and lumbar regions at certain points of the lateral and posterior columns, and chiefly in the most central portions of the columns. They may be found in the star-shaped spots of vascular exudation.

The posterior commissure is the seat of the alteration which seems to us essential in tetanus. This change has never been noticed in tetanus, and is not the exclusive attribute of that affection, but may be found whenever the central part of the cord is inflamed.

Toward the beginning of the lumbar region, and at the sides of the central canal, obliterated by a mass of polyhedral nuclei, the same elements are seen arranged, some in small groups, others in transverse elongated series. At the middle of the lumbar enlargement, the appearance is different. In the centre of the commissure is a large, round mass of nuclei, on the sides were only a few groups—transverse or arranged circularly around the central canal. These nuclear elements do not seem to be contained in cellular envelopes.

The obliteration of the central canal is not the important point, but the occurrence of numerous nuclei in the gray commissure at a dis-

tance from the central canal. It is very singular that the lumbar region was most affected, whatever might be the seat of the wound causing the tetanus. In one case the thumb was wounded, and yet the cervical region showed nothing peculiar under the microscope.

In three of the cases the lesion just described was found; in the fourth the gray commissure and any elements of new formation were swallowed up in a vast focus of exudation.

The multiple lesions of the cord just described may be called sub-acute central myelitis (*myélite centrale suraiguë*).

In regard to the peripheric nervous system, the examinations were not so complete, nor the results so satisfactory. In one case of a wound in the chest, there were hæmorrhages in both sciatic nerves, under the neurilemma and in the cellular prolongations which that membrane sends into the trunk.

In another, the wound being near the right sciatic nerve, that nerve was found neither contused nor bathed in pus, but redder, more voluminous, and firmer, than that on the other side. This was so, only near the wound; higher up it seemed normal. Under the microscope it was found that many of the nerve-fibres had undergone atrophy. In no case was there granular fatty degeneration; the atrophy of the myelinel cylinders, and multiplication of nuclei, were the only changes noticed. On transverse section the masses of atrophied nerve-fibres were found throughout the nerve, and also in the nerve of the opposite side. These masses did not at all resemble the groups of small nerve-fibres found in healthy nerve-trunks.

In another with fracture of a leg, the sciatic nerve showed nothing abnormal, the crural was not examined. In another case, with wound of the thoracic walls, the intercostal nerves were not abnormal.

19.—*Condition of the Spinal Cord in a Case of Unithoracic Hemimelia.* E. TROISIER. (Arch. de Physiologie Norm. et Path., 1, 1872.)

The child, Marie C., aged six months, died of pneumonia. The right forearm was replaced by a rounded stump, about four centimetres long. On the ulnar side was a small cutaneous tubercle; inside of this was a wrinkle of the skin, which did not disappear on drawing upon the skin. Behind was a slight dimple which disappeared on drawing upon the skin. There was no cicatrix. The elbow was well formed, with the normal prominences, and the shoulder was as well developed as that on the opposite side.

The principal nerves of the forearm were represented by well-developed nervous cords terminating in exceedingly thin filaments, which were lost in the skin of the stump. The muscular tissue was normal in structure.

In the fresh state there was nothing to notice in the external view of the spinal cord; the cervical enlargement existed. The anterior and posterior roots of the nerves seemed equal in size on the two sides.

After hardening the cord and making section perpendicular to the long axis, an appreciable difference in size between the two sides was

cen: the right half was to the left half as 49 to 52. The diminution in volume affected, almost exclusively, the gray substance; the white substance was only slightly diminished. The anterior and posterior cornua were narrower and shorter; the lateral and posterior columns were diminished in size, the anterior column was scarcely altered. The want of symmetry was most marked in the lower half of the enlargement, and especially at the point of union of the upper three-quarters with the lower quarter; at the lowest part of the enlargement it was much less pronounced, and in the dorsal region did not exist.

Throughout the lumbar enlargement, the left side (the opposite side) was smaller than the right, in the proportion of 37 to 40.

The character of the nerve-cells in the right half was the same as in the left, but their number was less; in one case, 125 in the left anterior cornu, and 42 only in the right; higher it was 140 on the left and 97 on the right.

The nerve-fibres in the cord appeared to be entirely normal in all respects, so that the number was probably diminished on the right. The trabeculae of connective tissue did not seem more developed on one side than the other. There was no focus of degeneration.

The author thinks it a case of arrest of development, and not of inter-uterine amputation, and proposes to call it agenesis of the nervous elements.

PREPARED BY DR. H. D. NICHOL, OF NEW YORK.

20.—*Contribution to our Knowledge of Cerebro-Spinal Sclerosis.*
By H. SCHÜLE, Assistant-Physician in Illenau. (Deutsches Archiv für Klinische Medizin, Bd. viii., Heft. 3 und 4.)

The case is that of a girl fourteen and a half years of age, the daughter of healthy parents. The disease dates from her seventh year; squinting and double vision, with no recognizable cause for their appearance, being the first symptoms. Within six weeks these disappeared, and were followed several weeks later by facial paralysis, first of the left side, then of both sides of the face—both disappearing very soon, to return again, and again disappear. In her ninth year there were twitchings in the fingers and toes, gradually spreading to the entire extremities and trunk, and a temporary anæsthesia. These symptoms continued for a short time, and were succeeded by a general paralysis of the muscles of the trunk and extremities, which began in the fingers and toes. In four weeks it had completely gone. The child, which, until then, had been very bright, began to be careless, lazy, forgetful, and irritable. She became subject to attacks of dizziness and vomiting, and to convulsive movements of the limbs, which (movements) were crossed, as, for example, in the right leg and left arm. Consciousness was unaffected. These attacks disappeared little by little. At the age of eleven and a half years the general paralysis of motion again occurred in the same manner as at first, but vanished in three weeks time. From this time forward, however, the muscular

movements were feeble and uncertain, particularly in the feet. During her twelfth year the squinting and double vision would return frequently; there were, occasionally, mild convulsive paroxysms, with dizziness and vomiting; but without loss of consciousness. At the beginning of her thirteenth year, in addition to the increasing paralytic weakness of the left side of the body, loss of memory, and a capricious, obstinate behavior, began to appear. Three months later a third general paralysis came on, from which she for the most part recovered, although the left side of the body became still more feeble, and her gait more unsteady. Considerable disturbance of coördination in the movements of the upper extremities; paralysis of the levatores capitis; tremor capitis. At thirteen and a half years, choreic movements in hands and feet, which continued for eight months, absent during sleep; very great ataxia in upper and lower extremities. At fourteen years another general paralysis, lasting for four weeks; very frequent headaches and dizziness; pain in the back and in the larger joints. At fourteen and a quarter years, menstruation began; paralysis of m. detrusor vesicæ; twitchings of legs, comparable to electric shocks; feeling of constriction at the waist. At fourteen and a half years, articulation first became difficult; right facial paralysis; behavior very childish; mind feeble; double vision, occasioned by weakness of m. rect. int. oculi dext.; some nystagmus; increased disturbance of articulation; mastication and deglutition unimpaired; ataxia of extremities; muscular force of right half of body very much diminished; right foot adducted, due to paralysis of extensor and abductor muscles of the leg, which are very much atrophied; galvanic and faradaic excitability intact; sensibility normal; reflex excitability retained. The body trembles and totters in walking, but, when supported gently from behind, is steady. At times, often for days together, also during sleep, considerable trembling, with to-and-fro movements of the legs, as in paralysis agitans. Later, although the movements of the tongue were unaffected, there were fibrillary twitchings of the lingual muscles, articulation became very much disturbed, broken, uneven, unrhythmical; uvula palati drawn toward the left side; mastication and deglutition difficult; patient would laugh and cry without cause; great mental weakness. She was unable to raise herself without using her hands; considerable paralytic tremor of the upper extremities; no great amount of muscular atrophy; sensibility retained. Suddenly paralysis of the muscles of the pharynx appeared, with double ptosis; the difficulty of articulation increased, and death succeeded to a profound coma.

Autopsy.—The meninges of the brain, except where they cover the first convolutions, are glistening, very hyperæmic, anteriorly cedematous. The convolutions of the left hemisphere are well in apposition; those of the right hemisphere are diminished in size, are drawn in, and the sulci are widely open. The entire encephalon, excepting the hemisphere, is very tense and hard; palpation of the upper surface of the brain gives likewise increased resistance, caused by alterations in the medullary substance. The entire corona radiata is transformed into a dense, callous mass, comparable to a hard, gummy tumor. This callous induration upon the right side reaches quite to the cortical substance;

upon the left a thin layer of medullary substance still remains. The degeneration retains its highest development in the neighborhood of the posterior cornu, and exists under three forms:

1. A white, yellowish-white;
2. A dirty-brown;
3. A steel-gray, changing here and there into a reddish.

The yellowish-white is the most general, and penetrates, as a continuous mass, into both hemispheres. The two other varieties are found more in groups, the steel-gray occurring in the cortical substance, the dirty-brown only in the medullary, which is anæmic and diminished in diameter. The disease has progressed farther in the right hemisphere than in the left, and shows itself also in the ganglia at the base of the brain. The three numbers of the lenticular nucleus are shrunk to less than half their normal size, and, on account of cicatricial-like contractions, are scarcely recognizable. The thalamic optici, claustrum, and insulæ Reilii, have all undergone degeneration. The condition of the pons and the adjoining portions of the encephalon is the most striking. In the right hemisphere the diseased parts are hard; in the left, the corresponding parts, though in spots somewhat denser than normal, still retain their size and form. The left lobe of the pons appears, microscopically, to be healthy, as also those fibres of the pyramids which pass through it; their number, however, is upon the right side greatly diminished. Here, the sclerosis no longer exists in patches, but is a continuous mass, occupying uniformly the entire brain, and embracing completely the right half of the pons. The cerebellum grates upon section. The gray substance in both its hemispheres has given place to the yellowish-white and steel-gray degeneration, general in some portions, in others found only in patches. The medulla oblongata is very tense and hard, the gray degeneration being very marked in the medullary substance of the lower portion. (More minute description is wanting, as this preparation was lost.)

The gray degeneration in the spinal cord is most extensive in the posterior columns, next in the lateral, and least in the anterior. The medullary substance in the upper cervical region is nearly normal. Lower down the gray regeneration is confined to the columns of the cord, where it exists in the shape of a wedge, the base being uppermost. The diseased portions have the consistence of a soft, but resisting gumma. It is worthy of note that the right anterior horn, from the centre of the cervical portion downward, is enlarged, and, although its outline is still well defined, yet at certain points it becomes merged, with the entire segment of the cord, into a large patch of the gray degeneration. In the inferior cervical region this enlargement becomes a soft, pulpy mass, which, when cut into, readily flows away, leaving a large cavity within the anterior horn. The consistence of the left anterior horn is less than normal (it is not pulpy, however), its color is rust-brown, and it is streaked with small, whitish fibres. The softening extends downward to the lower dorsal region.

Microscopic examination of the brain shows that the steel-gray, softened, and discolored cortical substance is composed of a very dense stroma with an immense quantity of granular cells—in the deeper

layers, the connective tissue becomes more opaque, consists of larger or smaller irregular patches of a dull-yellow or grayish tissue, in which the minute cells rest. This grayish tissue splits up into coarser or finer fibrils, the fibrillation originating in the patches. The above characteristics are still more pronounced in the yellowish-white deposits in the medullary substance. Firm, compact bundles of fibres, containing oval or stellate cells, are everywhere seen—corpora amylacea, and blood-pigment in abundance. The dense masses in the medullary substance exhibit the highest grade of the pathological process which attains its acme in the patches of the white sclerosis. In some places, the nerve-fibres have entirely disappeared, or they are without the white substance of Schwann, are varicose, or have undergone fatty degeneration. Nearly all of the ganglion-cells of the cortical substance are changed, having undergone retrogressive metamorphosis.

The walls of the vessels are considerably thickened; and the same fibrillary destruction (as was found in the stroma, described above) is noticeable in the surrounding yellow mass.

Microscopic examination of the spinal cord in the fresh state showed that, where the gray matter had become the seat of the sclerosis, its neuroglia was in the same condition as that of the gray matter of the brain; in the blood-vessels there were the same changes as in those of the brain—there were no nucleated cells. The pulpy mass in the anterior horn contained, in a delicate net-work of connective tissue, broken-down nerve-fibres, degenerated neuroglia, and enormously wide, swollen, glistening axis-cylinders. The ganglia also are swollen and softened, and the cells are not transparent.

Preparations treated with turpentine, and colored with carmine, render the condition described above more evident, and show still more plainly how extensively the anterior horns are involved in the diseased process. The new growth may be seen, with even a weak magnifying power (220), in the neuroglia of the gray matter, and, with 560, a cross-section of delicate fibrils is visible, among which denser fibres, having their origin in many-tailed cells, are found. The axis-cylinders, though altered, are still recognizable, and are partially comparable to those described by Hadlich (*Virchow's Archiv*, Bd. 46). The turpentine preparation showed a loss of substance, with an uneven, notched outline, at that part of the centre of the anterior horn where in the fresh specimen the cavity had been.

Changes, similar to those already noted, though less in extent, were found in the posterior horn. The *tractus internudis lateralis* showed the least amount of change.

The degeneration in the columns of the cord occurs under two forms. In one, the degeneration, following the course of the normal tissue, advances into the fibres of the neuroglia, and attacks successively the entire internervous net-work. These web-like bands appear to be spread out over considerable space, are thickly studded with cells and cell-nuclei, and are filled in, as it were, with the same homogeneous material as was found in the gray matter. In some portions of the hypertrophic connective tissue cross sections of nerves are

present; in others they have disappeared, or are very rare. The walls of the blood-vessels are thickened, and filled with granular cells. In the other form, the course of the normal tissue is broken through; portions of the columns are forcibly separated ("auseinander geworfen," Rokitansky) from one another by more or less extensive patches of a dense connective tissue, which is filled with multitudes of cells. In the majority of these patches no trace of tubular nerve-fibres could be found upon cross-section. The patches of sclerosis were sometimes isolated, sometimes they had broken through into the degeneration of the anterior horns. No further pathologico-anatomical distinctions could be made between these two forms of degeneration.

The process of degeneration in the individual columns of the cord seems to have gone on without following any particular order of progression, except in the vicinity of the blood-vessels, where it would seem that the disease, by preference, had advanced the farthest.

Dr. Schüle, in reviewing the clinical and anatomical points of the case, observes that none of the prominent symptoms, recently described by Leube, as characteristic of the *isolated* sclerosis, are wanting—nor is that trembling of the head and extremities absent which occurs when a paresis is becoming a paralysis; sensibility also is intact. Visual disturbance exists—paresis of the hypoglossus, facialis, and accessorius—and the characteristic difficulty of articulation; besides these, dizziness and occasional vomiting. These symptoms will be accounted for by the extensive inroads of the isolated patches of sclerosis into the substance of the brain and spinal cord. But, besides these, there was found in the brain a continuous sclerosis, as the result of which, the right hemisphere in particular was so much shrunken that it was impossible to make out the outlines of the ganglia at the base. The process was still more pronounced in the pons, whose right half was very much shrunken. The degeneration in the spinal cord was diffuse, the gray matter being most extensively involved. Here the disease assumed the form of a myelitis chronica, diffusa, parenchymatosa, et centralis.

It will be seen from these facts that there is a difference between the degeneration in the brain and in the spinal cord—a diffuse sclerosis is found in both; in the former only, in addition to this, does the sclerosis manifest itself in disseminated patches. The question arises, if it be possible, at the bedside, to make a differential diagnosis between the two forms. The conclusions upon this point which Schüle draws (which may be seen in the original article) are not sufficient to decide the question. By reason, however, of the entire correspondence of the symptoms of this case with those of another already described by Schüle, a certain agreement is seen to exist between them, which, from a clinical stand-point, consists in that, in addition to the trembling (which would cease when the patient was gently supported from behind), there was often for days together, even during sleep, a continuous to-and-fro movement of the legs; and in that, in spite of the presence of all the symptoms betokening the disseminated sclerosis, articulation had this peculiarity, that frequently

single syllables would be spoken very rapidly, and then the succeeding ones would follow in the characteristically slow and drawing manner. In these anomalous symptoms the author finds a resemblance to the description of paralysis agitans which Skoda, and later Topinard, have included under sclerosis of the pons and medulla oblongata.

The author is correct in calling attention to the fact that it is very unusual to find cerebro-spinal sclerosis occurring so early as the seventh year.

21.—*Original Communication with regard to the Action of Hydrochloral in Diseases of the Mind.* By Dr. ANTON HOLLER, Attending Physician to the Insane Retreat in Klosternenburg.

Dr. Holler has made experiments with opium, morphine, and hydrochloral, with reference to their comparative hypnotic effect, with the following results :

1. H. F., an imbecile, was suffering greatly from sleeplessness. He was treated with one-drachm doses of hydrochloral—sleep followed usually in fifteen minutes, and lasted ordinarily for three hours, sometimes for eight, and once for ten hours.

The patient, growing very restless again, and complaining much of disturbance of sight and hearing, received in the evening one-sixth of a grain of morphine. But, as he became no quieter, at eight and at nine o'clock one grain was given, without sleep resulting, or the restlessness diminishing, and not until after the administration of two drachms of hydrochloral was a quiet sleep induced, which continued for nine and a half hours, and was followed by no unpleasant sensations. Repeated experiments upon the same patient, alternating the use of the chloral with that of morphine, showed the former to be the more effective remedy. Both medicines, however, failed in their action upon those days when there was no motion of the bowels, or where any unusual excitement was present.

The hydrochloral, during a period of three and a half months, failed only twice to produce sleep; while, in forty-six days, the exhibition of morphine was followed nine times by a negative result.

2. H. E., a lunatic, sexually highly excitable, with hyperæsthesia of the skin; suffered greatly from sleeplessness. He was treated subcutaneously with from one-half to one grain of morphine, without sleep resulting—excepting upon one occasion, when, the injection being twice repeated within five hours, he slept for two and a half hours, and, upon awaking, complained of great dizziness. The hydrochloral in half-drachm doses was followed within thirty minutes by a quiet sleep. Opium also was tried upon this patient, from one to five grains producing no sleep, and six to eight grain doses causing only from one and a half to three hours' sleep; while, after the hydrochloral, he would sleep for six or seven hours. When opium was employed in conjunction with wet blankets to the surface of the body, he would occasionally sleep for four or five hours; at other times, however, not at all. The use of the wet blankets without the opium was less satisfactory than the combined use of the two means.

3. Catharine B., aged forty-seven years, suffered from religious melancholy; was greatly troubled day and night with tinnitus aurium, causing her to pass entire nights without sleep. On September 11, 1870, the employment of hydrochloral, in one-scruple doses, was begun; several hours of uninterrupted sleep followed its administration. From that date it did not fail in a single instance to produce a similar result, which was even more decided when there had been no passage from the bowels. In course of time it became necessary to augment the dose to two scruples. Her pulse sank in the mean time to 66, and the quantity of urine (as had already been noticed in other cases) was increased. The disturbance in hearing diminished very decidedly.

4. Catharine R., aged fifty-three years, an epileptic, subject to violent nymphomaniacal attacks. On September 10, 1870, after a convulsion which lasted for ten minutes, she became very violent. One scruple of chloral subdued this outbreak completely, and, in fifteen minutes after its administration, a quiet sleep had set in, which continued for six hours. At the end of a week, it became necessary to double the dose, after which the patient would sleep throughout the entire night. Under this treatment, although the epilepsy continued, all nymphomaniacal manifestations disappeared.

5. Maria W., aged thirty-one years, likewise an epileptic, with accompanying irritation and aberration of mind, also was treated by hydrochloral; ordinarily, a seven hours' sleep, and a much longer period of calm, following its administration.

6. Maria L., aged thirty-six years, an imbecile, was subject to nymphomaniacal attacks, for which at first morphine had been given, with no very satisfactory result. Each exhibition of chloral in half-grain doses produced a quiet sleep of about eight hours' duration, while the paroxysms of insanity and the nymphomaniacal attacks gave place to a calm and tranquil state of mind.

7. Barbara M., aged fifty-six years, melancholic and hysterical. This patient has occasionally hysterical convulsions, complains of extreme sensibility over the spinal column, weeps very readily, suffers constantly from terror, is always very melancholy, and sleeps very little. In her case half-grain doses of chloral produced a continuous, refreshing sleep; the patient herself begging eagerly for the medicine. The quantity of urine is decidedly increased after each dose of the chloral.

22.—*Colloid Degeneration of the Brain in General Paralysis.* By Dr. MAGNAN, of Paris. (Archiv der Deutschen Gesellschaft für Psychiatrie, redig. v. Sanit. R. Erlenmeyer, Jahrg. xvii., No. 3.)

We give a summary only of the conclusions in this very exhaustive treatise:

1. The disease, generally described as "diffuse interstitial encephalitis," may be attended by the action, at circumscribed points, of a very powerful irritation, which results in an active proliferation of the elements of the neuroglia and of the vessel-walls.

2. These proliferated cells become infiltrated by masses of colloid matter, instead of being transformed into connective tissue, as is usually the case. The nuclei are first attacked by this rapidly-increasing, morbid product, then the cells, and last the tissue proper itself.

3. The colloid degeneration has certain peculiarities, by which we are enabled to distinguish between it and other degenerations. The colloid mass appears as a hyaline substance; is, however, only slightly transparent, showing at certain points a feeble bluish reflection. In the smaller deposits it appears in the form of little regular heaps, which present more or less the appearance of healthy cells, or of masses of broken-down cells. When the colloid matter is present in larger quantity, and where several of the little groups have coalesced, it appears as an irregular mass marked by deep furrows.

The colloid matter is insoluble in alcohol, ether, and chloroform; in strong acetic acid it becomes pale, and gradually dissolves. Ammoniated tincture of carmine with potassa tinges it very rapidly. Tincture of iodine has no effect upon it, either with or without sulphuric acid. No change occurs upon the addition of hydrochloric acid. The mass is softened, but does not dissolve, in weak, watery solutions of potassa and soda. Warm fluids dissolve the mass; their action being promoted by the addition of potassa and soda.

It is, consequently, not fatty, because it is colored by carmine, and is insoluble in ether and chloroform. It is not inorganic, because hydrochloric acid has no effect upon it. It differs from corpora amyacea, in that it is unaffected by tincture of iodine, and from amyloid degeneration, in that it dissolves in strong acetic acid; cold solutions of potassa and soda have no effect upon it, and there is no reaction with iodine and sulphuric acid, peculiarities which characterize amyloid degeneration. (*Vide Études sur la Dégénérescence amyloïde par Hayem.*)

4. From its evolution and course, colloid degeneration might be regarded as a product of diffuse interstitial encephalitis; but its rarity and its circumscribed localization, upon the one hand, together with its individual characteristics, when it has attained to its highest point of development, upon the other hand, show it to be an altogether accessory lesion of general paralysis.

III.

ANTHROPOLOGY.

THE first meeting of the Anthropological Institute of Great Britain and Ireland was happily inaugurated by an admirable essay "On the Development of Relationships," by the President, Sir John Lubbock. It is based on Mr. Morgan's valuable contributions to ethnological science, and especially on his latest work, "Systems of Consanguinity

and Affinity of the Human Family," which "contains schedules, most of which are very complete, giving the systems of relationships of no less than one hundred and thirty-nine races or tribes."

Mr. Morgan divides the systems of relationship into two great classes—the descriptive and the classificatory. "The first," he says (p. 12), "which is that of the Aryan, Semitic, and Uralian families, rejecting the classification of kindred, except so far as it is in accordance with the numerical system, describes collateral consanguinei, for the most part, by an augmentation or combination of the primary terms of relationship. These terms—which are those for husband and wife, father and mother, brother and sister, and son and daughter, to which must be added, in such languages as possess them, grandfather and grandmother, and grandson and granddaughter—are thus restricted to the primary sense in which they are here employed. All other terms are secondary. Each relationship is thus made independent and distinct from every other. But the second, which is that of the Turanian, American Indian, and Malayan families, rejecting descriptive phrases in every instance, and reducing consanguinei to great classes by a series of apparently arbitrary generalizations, applies the same terms to all the members of the same class. It thus confounds relationships, which, under the descriptive system, are distinct, and enlarges the signification both of the primary and secondary terms beyond their seemingly appropriate sense."

Sir John says that, as he dissents from Mr. Morgan's interpretation of the facts in reference to social relation, he shall confine himself to the question of the bearing of systems of relationships on questions of ethnological affinity, and to a consideration of the manner in which the various systems have arisen. I should mention that the memoir is accompanied by elaborate tables drawn up from Mr. Morgan's facts, in one of which he gives the names of the most important relationships in eighteen different tribes inhabiting almost all parts of the globe; and that, without these tables to refer to, it is not always easy to follow the argument. He directs attention to the Wyandot system, in which a mother's brother is called an uncle, his son a cousin, his grandson a son when a male is speaking, a nephew when a female is speaking; his great-grandson, a grandson. A father's sister is termed an aunt; her son, a cousin; her grandson, a son; her great-grandson, a grandson. A father's brother is a father; his son, a brother, distinguished, however, by different terms, according as he is older or younger than the speaker; his grandson, a son; his great-grandson, a grandson. A mother's sister is a mother; her son is a brother, distinguished as before; her grandson a son when a male is speaking, a nephew when a female is speaking. A grandfather's brother is a grandfather; and a grandfather's sister is a grandmother. A brother's son is a son when a male is speaking, but a nephew when a female is speaking; while a sister's son is a nephew when a male is speaking, but a son when a female is speaking. Lastly, brothers' grandchildren, and sisters' grandchildren, are called grandchildren. This system, he observes, at first strikes one as illogical and inconsistent. How can a person have more than one mother? How can

a brother's son be a son, or an uncle's great-grandson a grandson? Again, while classing together several relationships which we justly separate, it distinguishes between elder and younger brothers and sisters; and, in several cases, the relationship depends on the sex of the speaker. Since, however, a similar system prevails over a very wide area, it cannot be dismissed as a mere arbitrary or accidental arrangement. The system is, moreover, far from being merely theoretical, but is in every-day use. Every member of the tribe knows his exact relationship to every other, and this knowledge is kept up by the habit, general among the American tribes, and occurring also elsewhere, as, for instance, among the Esquimaux, the Tamils, Telugus, Chinese, Japanese, Feejeeans, etc., of addressing a person, not by his name, but by his relationship. Among the Telugus and Tamils an elder may address a younger by name, but a younger must always use the term for relationship in speaking to an elder. This custom is probably connected with the curious superstitions about names; but, however it may have arisen, the result is that an Indian addresses his neighbor as "my father," "my son," or "my brother," as the case may be; if not related, he says, "my friend."

Mr. Morgan was much surprised to find that a system like that of the Wyandots' was very general among the red-skins of North America, but he was still more astonished to find that the Tamil races of India have one almost identical; and, after disposing of three hypotheses to account for this uniformity, concludes that it must be due to "transmission with the blood from a common original source."

"That there is any near alliance" (says the author) "between the red-skin and Tamil races, would be an ethnological conclusion of great importance. It does not, however, seem to me to be borne out by the evidence. The Feejeean system, with which the Tougan is almost identical, is very instructive in this respect, and scarcely seems to have received from Mr. Morgan the consideration which it merits. Now, it appears, from Table 1, that the Feejeean and Tougan systems are identical with the Tamil. If, then, this similarity is, in the case of the Tamil, proof of close ethnological affinity between that race and the red-skin, it must equally be so in reference to the Feejeeans and the Tougans. It is, however, well known that these races belong to very distinct divisions of mankind, and any facts which prove similarity between these races, however interesting and important they may be as proofs of identity in human character and history, can obviously have no bearing on special ethnological affinities."

The author, after pointing out the reasons why he cannot adopt Mr. Morgan's views, either on the causes which have led to the existence of the Tamil system, or as to the ethnological conclusions which follow from it, gives his own explanation of the remarkable similarities between races so distinct and distant as the Wyandots, Tamils, Feejeeans, and Tougans; and for this explanation I must refer to the memoir itself. I must content myself with one extract, which is of special philological interest, and with giving the author's summing up of his essay:

"As already mentioned, the European nations follow, almost with

out exception, a strictly descriptive system, founded on the marriage of single pairs. The principle is, however, departed from in a few very rare cases, and in them we find an approach to the Karen-Esquimaux system. Thus, in Spanish, a brother's great-grandson is called 'grandson.' Again, in Bulgarian, a brother's grandson and sister's grandson are called '*mal vnook mi*,' literally, 'little grandson my.' A father's father's sister is termed a grandmother, and a father's father's brother a grandfather, as is also the case in Russian. The French and Sanscrit, alone, so far as I know, among the Aryan languages, have special words for elder and younger brother. Among Aryan races the Romans and the Germans alone developed a term for cousin, and we ourselves have, even now, no word for a cousin's son." The history of the term "nephew" is also instructive. "The word *nepos*," says Morgan, "among the Romans, as late as the fourth century, was applied to a nephew as well as a grandson, although both *avus* and *avunculus* had come into use. Eutropius, in speaking of Octavianus, calls him the nephew of Cæsar, *Cæsaris nepos* (lib. vii., c. i.). Suetonius speaks of him as *sororis nepos* (Cæsar, c. lxxxiii.), and afterward (Octavianus, c. vii.) describes Cæsar as his greater uncle, *major avunculus*, in which he contradicts himself. When *nepos* was finally restricted to grandson, and thus became a strict correlative of *avus*, the Latin language was without a term for nephew, whence the descriptive phrase, *Fratris vel sororis filius*. In English, *nephew* was applied to grandson, as well as nephew, as late as 1611, the period of King James's translation of the Bible. Niece is so used by Shakespeare in his will, in which he describes his granddaughter, Susannah Hall, as 'my niece.'

"So that even among the most advanced races we find some lingering confusion about nephews, nieces, and grandchildren."

From the full consideration of the vast collections of facts accumulated by Mr. Morgan our author finally arrives at the following conclusions:

1. That the terms for what we call relationships are, among the lower races of men, mere expressions for the results of marriage customs, and do not comprise the idea of relationship as we understand it; that in fact the connection of individuals *inter se*, their duties to one another, their rights, the descent of their property, are all regulated more by the relation to the tribe than by that to the family; and that, when the two conflict, the latter must give way.

2. That the nomenclature of relationships is, in all the cases yet collected (from the simple and rude system of the Sandwich-Islanders, up to the far purer and more correct terminology of the Karen and Esquimaux), explicable only on the theory of a gradual improvement and elevation, and is incompatible with degradation.

3. That, while two races in the same state of social condition, one of which had risen from the lowest known system, and the other had sunk from the highest, would necessarily have a totally different system of nomenclature for relationship, we have not a single instance of such a system as would result from the latter hypothesis.

4. That some of those races, which approximate most nearly to our

European system, differ from it upon points only explicable on the hypothesis that they were once in a much lower social condition than they are at present.

Next in importance to this paper is the following, which was also read at a meeting of Anthropological Institute. It is entitled "The Mental Characteristics of Primitive Man as exemplified by the Australian Aborigines," and is written by Mr. C. Staniland Wake, who attempts to effect a double object, namely, primarily to establish what are the real mental phenomena exhibited by the natives of Australia; and, secondarily, to show approximately the condition in which man generally must have existed in the primeval ages, not necessarily when he first appeared on the earth, but so soon as the struggle for existence between man and man commenced, and the selfish instincts of humanity had had time to become fully developed.

The mental characteristics naturally divide themselves into those intellectual, and those moral. To speak, however, of intellectual phenomena, in relation to the Australian aborigines, is somewhat of a misnomer.

"When, therefore," says Mr. C. S. Wake, "I speak of intellectuality, I refer to that simple activity of the mind which is necessary to the performance of the actions required for the maintenance of life, and for the display of those simple phenomena, almost instinctive, nevertheless, in their nature, which may be supposed to result from the reflective exercise of the human mind on external objects, as distinguished from the merely instinctive thought of the animal. What I thus describe as the intellectual phenomena of the Australian aborigines are few, and have relation only to the exigencies of social life. The ingenuity displayed by them in overcoming the many difficulties they have to contend against in dealing with the hard conditions of Nature is often, no doubt, very great. Their appliances are, however, often temporary, although not always so, as may be seen from their use of nets for fishing and bird-catching; these being well made, as are generally also their baskets, bags, and mats. Great ingenuity is, moreover, undoubtedly shown in the native weapons; one of which—the boomerang—would appear to be unknown, in principle at least, to any other race.

The skill of the aborigines is well displayed in the well-sinking, so many examples of which Sir George Grey found in Northwestern Australia, near the Hutt River. Mr. Eyre also met with similar constructions in his journey from Adelaide to King George's Sound. Of those near Smoky Bay, he says: "These singular wells, although sunk through a loose sand to a depth of fourteen to fifteen feet, were only about two feet in diameter at the bore, quite circular, carried straight down, and the work beautifully executed." The natives could reach the water only by means of a pole placed against the side of the well, and its use required the greatest care lest the sand should fall in.

In some respects, the drawings and paintings which have been found in various parts of Australia are the most interesting phenomena presented by the native intellect. The cave paintings discovered by Sir George Grey are too well known to require description here;

and the same may be said of the drawings on Clark's Island, near Cape Flinders, seen by Mr. Cunningham.

Mr. Collins long ago stated that most of the implements used by the natives of Port Jackson "are ornamented with rude carved work, effected with a piece of broken shell." He adds that, on the rocks, he had seen "various figures of fish, clubs, swords, animals, and even branches of trees, not contemptibly represented." It will not be pretended that any of the native drawings furnish evidence of great artistic skill. They may occasionally exhibit a certain amount of rude vigor, but as a rule they may be classed with the productions of children. As to most of them, moreover, the natives assert that they know nothing as to their origin, and this we may well believe, when, as Mr. Oldfield states, they cannot distinguish the picture of a man from that of any other object, unless all the lesser parts, such as the head, etc., are much exaggerated.

The aborigines have no system of government, and no chief in the ordinary acceptance of the word; but any breach of ancient customs is followed by universal reprobation.

Their *moral character* is differently estimated by different observers. Collins said of the natives of New South Wales that they were great thieves, and adepts in the arts of evasion and lying, but that they were susceptible of friendship and capable of sorrow, although this was a very transient emotion. Eyre, on the other hand, described them as frank, open, and confiding, although they have some social failings. The very persons of whom he speaks so well were brutally cruel to their wives. Sir Thomas Mitchell remarks of the natives of the banks of the Goulbourn River (Port Philip), that "no kindness had the slightest effect in altering the disposition and savage desire of these wild men to kill white strangers, on their first coming among them." This undoubtedly betokens a very low condition of the moral nature, which is no less shown by reference to many of the native customs. Thus, Sir George Grey says that in practice the aborigines reject "all idea of the equality of persons or classes. The whole tendency of their superstitions and traditional regulations is to produce the effect of depriving certain classes of benefits which are enjoyed by others." The favored classes are the old or the strong, who obtain their advantages at the expense of the female sex, the young, and the weak, who are condemned to "a hopeless state of degradation."

We see in these laws and customs, which underlie the very constitution of Australian aboriginal society, the operation of that "unmitigated selfishness" which Mr. Gideon Lang declared to be the disposition of at least all the male natives. The only inference that can be made from this fact, and from certain other phenomena, mental and social, to be shortly mentioned, is that moral ideas have in the case of the Australian aborigines remained almost wholly undeveloped. This is shown by nothing better than the slight regard paid among them to female chastity.

In the total absence of all idea of female purity, it need not be wondered at that abortion and infanticide are appallingly frequent, and the want of natural affection exhibited in these customs is shown in other ways. Thus, Mr. Eyre asserts that, when ill, a wife is sometimes

left to die, if the tribe is removing to another locality, and "parents are treated in the same manner when helpless and infirm." It should be added, however, on the testimony of Mr. Oldfield, that among the western Australians great care is taken of the blind, deaf, dumb, halt, and withered, by their comrades.

In the west, also, the mother would seem to have a real affection for her offspring, although there, too, it sometimes has curious accompaniments. Mr. Oldfield, when speaking of cannibalism among the natives generally, says that a man will, in case of extremity, kill his child to satisfy his hunger. In these cases "the mother is not permitted to make loud lamentation, else she is beaten; she may, however, express her grief by uttering low, stifled moans, but, how great soever her sorrow for the loss of her child may be, it becomes somewhat assuaged when the head of the victim, the mother's legal perquisite in all such cases, is thrown to her, and this she proceeds to eat, sobbing the while."

It is only fair to record, as a set-off against the facts above stated, that Mr. Eyre indignantly protests against those who represent the Australian native as being entirely wanting in natural affection.

How are we to reconcile the apparent inconsistency between the display of affectionate emotion recorded by Mr. Eyre, and the treatment of the native women? In fact, the woman is the slave of the man, and appears to be treated as a dog; no one will take her part, even though she really be innocent of that for which she is punished.

The character of the native women, however, does not appear to be such as to secure them much sympathy. Sir George Grey states that "the ferocity of the women, when they are excited, exceeds that of the men; they deal dreadful blows at one another with their long sticks, and, if ever the husband is about to spear or beat one of his wives, the others are certain to set on her, and treat her with great inhumanity." The old wives are extremely jealous of the young ones. The women, moreover, are not without influence in the tribe. The old ones often incite the men to acts of revenge, and, when once an old woman begins a chanting address of this kind, "nothing but complete exhaustion induces her to stop, and the instant she pauses another takes up the burden of the song. The effect some of them produce upon the assembled men is very great; in fact, these addresses of the old women are the cause of most of the disturbances which take place."

The various facts hitherto detailed are explainable only on the assumption that the natives of Australia are, in all questions of morality, and in all matters connected with the emotional nature, mere children. There may occasionally be great display of affection, and this, as in the case of women who have lost their young children, may sometimes last for a considerable period; but, however intense the emotion, it is not, as a rule, of long continuance. The very affection for children, which is the chief redeeming feature in the character of the Australian native, is carried so far as to amount to a weakness. The children are seldom, if ever, corrected, and the boys soon become utterly regardless of their mothers, and often tyrannize over them. It

is, however, by the nature of their general ideas of morality that the true condition of this people must be determined, and, judged of by this test, such condition must be of a very childish character. They have, undoubtedly, the simple notion of a distinction between right and wrong, but we shall not be incorrect if we affirm that it is founded altogether on the rights of property. This is evident from the ideas entertained as to theft. To take that which belongs to another native is, no doubt, considered a great crime, for it interferes with the rights of property. To steal from a white man is, however, very different, and, with few exceptions, the tribes met with throughout the whole continent appear to be dexterous thieves.

While they see no impropriety in lending their wives to their friends, they will not allow them to be run away with; the recognized punishment of a wife-stealer being "spearing in the calf of the leg, or standing to receive the spears of the offending tribe, with only a shield as a safeguard," while the stolen property is more severely dealt with than the stealer.

There seems, indeed, to be an almost total absence from the mind of the Australian native of any idea of abstract morality, or even true instinct of moral propriety. The immaturity of nature which this fact shows is revealed also by the superstitious notions with which the native mind is saturated. It is not necessary for me to enter into particulars of the many curious superstitions which show the low moral condition of the Australian aborigines. Many of these are connected with the belief in the existence of spirits—such a belief, which is evidence of some notion of a future life, being universal. The idea of a future life associated with it is, however, very indefinite, and has had a negative origin. The savage cannot form any idea of death, and therefore he supposes the dead still to exist, and he sees their activity in various operations of Nature which affect him more or less injuriously. It is very improbable, however, that the Australian native ever really thinks on the subject, his actions in relation to which are governed by mere traditional instinct. His notions as to the existence of a Great Being have arisen, no doubt, from the belief in the *In-gnas*, or shades of the dead. Dr. Lang is certainly right when, in opposition to Strzelecki, he affirms that the Australian aborigines do not recognize a God. They have nothing whatever, says Dr. Lang, of the character of religion, nor is there any trace among them of idolatry.

The opinion that the Australian aborigines are still but children in their general mental development is quite consistent with certain other phenomena, which may be shortly referred to. Thus Wilkes says of the natives of New South Wales: "They are not great talkers, but are usually silent and reserved; they are generally well disposed, but dislike to be much spoken to, particularly in a tone of raillery." Wilkes adds: "Their great timidity has caused a false estimate to be put upon their character, by ascribing to it great ferocity." The furious onsets made by strange natives on parties of white men "arise from the panic with which they are seized depriving them temporarily of reason." Like children, in fact, they are afraid of the ghosts which they conjure up, although in the present case those which the

Australian fears take the substantial form of white Europeans. The seemingly ferocious conduct of the natives may be explained partly by reference to timidity, and partly by their belief that the white man has returned to claim his property, or at least that he wishes to appropriate that of the tribe. This belief is probably the real explanation of the unfriendly opposition usually met with by travellers in the interior, pleasant exceptions to the rule being furnished by the natives who assisted Leichhardt and Eyre.

"I cannot help thinking," says Mr. Wake, "that the difference in the reception experienced by various travellers at the hands of the natives has in great measure a personal origin. The savage, as the child, instinctively likes or dislikes a stranger; and hence, when one person may be violently repulsed, another will be welcomed by him, until his latent suspicions are brought into active operation through some ill-judged act of his visitor."

One other characteristic of the Australian aborigines deserves to be mentioned: it is the power which grimaces have over them. Captain King says that friendly terms were renewed with the Cape Flinders tribe chiefly by means of grimaces and ridiculous gestures, which, he adds, are "always acceptable to the natives of this part of the world." Commodore Stokes made the same discovery when exploring Clarence Strait, where two of his companions escaped spearing only by dancing and making grimaces for a considerable period, until the attention of their enemies was diverted elsewhere. A like mental phase is exhibited in the power of mimicry which the natives possess in a high degree. I may remark that these characteristics are consistent with the talkative and merry nature noticed by many travellers, especially among the young natives, and with the universal love of what they know as music, singing, and dancing.

To sum up what has gone before, it is evident that the aborigines of Australia, as compared with the races who have made further progress in mental culture, are yet in the condition of children. Among all the tribes, whether the more hostile ones of the east, or those which in the west appear to give evidence of a milder disposition, there is the same imperfect development of moral ideas. In fact, none of them have any notion of what we call morality, beyond the simple one of right and wrong arising out of questions of property. With this moral imperfection, however, the Australian natives exhibit a degree of mental activity which, at first sight, may be thought inconsistent with the childish position here assigned to them. It is evident, however, that this activity results from the position in which the Australian is placed. Extremely indolent when food is plentiful, when it is scarce the greatest exertions can be made for its acquirement, and the repeated exercise of the mind on the means of accomplishing the all-important end of obtaining food has led to a development of the lower intellectual faculties, somewhat disproportionate to the moral ideas with which they are associated. Probably, it is a result of the undue mental activity thus shown, that idiocy is common among the natives when old age is reached, although not among the young. Another consequence is seen in the proud independence ex

hibited among many of the tribes, which often gives them an air of haughtiness and insolence.

In view of the facts I have stated, how is it possible to assert that this race has degenerated from a higher state of civilization? And yet this is the position taken by some writers.

"So far, however, as I can judge, the phenomena referred to in the present paper are utterly inconsistent with the degradation supposed. The negative evidence furnished by the absence of many things possessed by other barbarous peoples, showing such a deficiency in the conveniences of social life, seems to me to be a sufficient refutation of such an opinion. That the Australian aborigines do possess certain points of affinity with other races is unquestionable, and I think it is extremely probable that the inquiries of Dr. Bleek point in a right direction. They do not, however, prove that the Australians have fallen from a higher state of civilization, or that, as a race, they have been derived either from Southern India or from Northern Asia. The facts which appear to support such a notion as this are explainable on the assumption which may, I believe, be supported by physical data, that the Australians are more or less a mixed people. Probably long before the establishment of the Chinese Empire there was a great movement of Asiatic peoples, the so-called Scythic element, which spread throughout the Indian Peninsula, and reached Southern Africa on the one side of the Indian Ocean and Australia on the other. Nowhere, except perhaps in the Indo-Chinese Peninsula, was this Scythic element so powerful as to destroy or to absorb the native element, and in Australia especially its influence was comparatively weak, since it reached that continent already diluted by contact with the so-called Malay peoples."

OBITUARY.

GEORGE EDWARD DAY, M. D., F. R. C. P., F. R. S.

THE readers of the *JOURNAL OF PSYCHOLOGICAL MEDICINE* have experienced a loss in the death of Dr. Day which it will be difficult to supply, and the medical profession on this side of the Atlantic will unite with their brethren in Great Britain in regret at the demise of one who had made so prominent a place for himself in literature and science, and whose qualities as a man endeared him to all who knew him. Perhaps the last papers he wrote were those which he contributed to the present number of the *JOURNAL*.

The following notice of his life and death is extracted from the *British Medical Journal*:

Dr. G. E. Day was born in 1815, his father being a gentleman of property, living at Manarabon, near Llandilo. During the early boyhood of the subject of this memoir, in 1825, Mr. Day lost every thing that he possessed in consequence of the failure of the Swansea Bank, in which he had been induced, at the solicitation of an old school-

fellow, to become a partner only six months previously. Dr. Day's mother was the daughter of Curtis Hale, Esq., of Hopley Court, a descendant of Chief-Justice Sir Matthew Hale. After the failure of the Swansea Bank, young George was received by his grandmother, Mrs. Hale, in her house, which became his home until he went to Cambridge. We believe, however, that he had in Worcestershire some preliminary initiation into the practice of medicine, being articulated to a general practitioner in that county.

He entered at Trinity College, Cambridge, and diligently studied mathematics, in which he soon became a proficient, and the pursuit of which in after-years, and in his last long illness, became one of his favorite recreations. From Trinity he emigrated to Pembroke College, and, after the usual period of study, he came out as a Wrangler, and took his degree of B. A. in 1837, and that of M. A. in 1840. After graduating as B. A., he proceeded to Edinburgh to study medicine; he there took Dr. Handyside's gold medal for Anatomy, in 1839-'40; Dr. Simpson's silver medal in Midwifery, in 1840-'41; Skae's Prize, in 1841; Atkin's gold medal in Physiological Botany, in 1841; and he obtained the Edinburgh Harveian Prize Medal in 1843. Strangely enough it happened, probably in consequence of dividing his attentions between the two Universities of Cambridge and Edinburgh, that he graduated in medicine at neither, although he had been so distinguished an alumnus of both; but in 1842 he received from the University of Cambridge a License in Medicine, which, although not equivalent to a degree, conferred a title to practise. From Edinburgh he came to London, and began practice in Southwick Street. He was Physician to the Western General Dispensary, and Lecturer on *Materia Medica* at the Middlesex Hospital; but he also worked hard with his pen, filling up his time and increasing his income by reviewing and translating. Among his more important works were a "Practical Treatise on the Diseases of Advanced Life," and "Chemistry in its Relations to Physiology and Medicine;" and he translated Simon's "Animal Chemistry," and the fourth volume of Rokitsansky's "Pathological Anatomy" for the Sydenham Society, and Lehmann's "Physiological Chemistry" for the Cavendish Society; he also translated Vogel's "Pathological Anatomy."

On the occurrence of a vacancy in the Professorship of Medicine at the University of St. Andrew's, in consequence of the death of the distinguished physiologist, Dr. John Reid, Dr. Day was nominated to the post; but, as the degree of M. D. was essential to the appointment, he obtained that title from the University of Giessen. He went to reside at St. Andrew's to fulfil his duties in the year 1849, and continued to perform them with the greatest credit until 1863. In his new position at St. Andrew's he continued his literary and scientific labors with his usual zeal and energy, and obtained some share of consulting practice in the neighborhood; but in 1857 he met with the accident which, by its direct effects and subsequent results, permanently disabled him from physical exertion, and made him a cripple for the rest of his life. In a holiday trip to Helvellyn, he fell through a chimney or culvert under the hill-side, communicating

with a white-lead mine, and he was rescued from his perilous position by some casual travellers. He had sustained a fracture of the right humerus, which, from some inexplicable cause, never united, and the limb was practically almost useless to him, the act of writing being accomplished by having his arm lifted on to a cushion, and the muscles of the forearm being alone employed. Soon after the accident just described, synovitis of the right knee-joint supervened and was never cured, so that eventually he became quite unable to walk from one room to another, and he was provided with a wheel-chair, in which he was moved from his bedroom to his sitting-room, and thence, when the weather permitted, into his garden.

On the resignation of his professorship at St. Andrew's, he removed to Torquay, in the hope that the mildness of the climate might restore his health. This expectation was unhappily disappointed; for he became worse with each succeeding year, although his mental vigor was as great as ever. It will hardly be credited that, while in the helpless physical condition above referred to, and when so tortured with pain that he scarcely ever slept without an opiate, he nevertheless occupied himself incessantly with scientific work, contributing articles regularly to *Chambers's Encyclopædia*, and to the *Medical Times and Gazette*, and other medical and scientific journals. His handwriting, it may be conceived, was most peculiar; but his friends and the compositors soon became accustomed to it, and he went on writing almost to the time of his death, which occurred on January 31st, after a short illness.

Dr. Day was an ornament to the medical profession, and was beloved by all who came into relations with him. Though struggling with disappointment in his early years, and embittered by physical suffering for a long period before the close of life, he never lost the sweetness of disposition which endeared him to a wide circle of friends, or ever murmured against the mysterious dispensation which blighted him in the midst of an honorable career, and doomed him to the condition of a helpless invalid. He was a man of great and varied attainments, and of great clearness of mind, and he retained the full vigor of his unusually strong intellect almost to the very last.

We may be permitted so far to draw aside the veil of private life, as to state that Dr. Day's sufferings were alleviated by the assiduous attentions of a devoted wife, who survives to lament his loss. He leaves besides a son and two daughters. We may further, without indelicacy, refer to the constant exertions he made, amid sorrow, suffering, and hard mental work, to leave after his death some adequate provision for his widow; but it cannot be a matter of surprise that, under the circumstances, his hopes have not been realized. His pension, which he received as a retired professor of the Scotch universities, dies with him, and his savings from his income, which was never large, are quite inadequate to the purpose he had in view. All that a man in his position could do was done by Dr. Day; and those who admired and loved the scholar and the gentleman while he was alive, may probably step forward with some friendly efforts to alleviate the grief, and improve the position of those whom he has left behind him.

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[The Original Department of this journal is not closed to articles, the views of which may be in opposition to those held by the editor. He does not, however wish to be considered as indorsing any opinions unless enunciated under his own name.]

ART. I.—*The Composition of Mind.* By JOHN FISKE, Assistant Librarian, and late Lecturer on Philosophy, at Harvard University.

IN pursuing the analysis of any complex series of phenomena, with the object of ascertaining the simple ultimate elements of which the complex series is made up, we shall most satisfactorily accomplish our purpose if we begin with the most complicated cases which the series presents. After explaining these by resolving them into their less complex components, our analysis "must proceed similarly with these components; and so, by successive decompositions, must descend to the simpler and more general, reaching at last the simplest and most general." Let us proceed, after this fashion, to inquire into the composition of mind. Beginning with the most highly-involved operations of conscious intelligence, and neglecting, for the time being, the consideration of those emotional states by which all operations of intelligence are

to a greater or less degree accompanied, let us pursue our analysis until we have arrived at those ultimate units of feeling in the manifold compounding of which all conscious operations, whether intellectual or emotional, consist.

Beginning, then, with a somewhat complicated operation of intelligence, let us consider the process by which an astronomer, knowing the dimensions of the earth, is enabled to calculate therefrom the distance of the moon. He must, in the first place, assimilate in thought the case of the moon to like cases in which the distances of inaccessible objects upon the earth are indirectly measured. When a land-surveyor wishes to ascertain the distance of a church-tower situated on the farther side of a river, he has recourse to an indirect method of measurement. Upon his own side of the river he first measures the distance between two points sufficiently removed from each other, and this distance he calls a base-line. From each end of the base-line he now takes a sight at the inaccessible tower, and, with the proper instruments, measures the difference between its direction and the direction of the base-line. In this way he obtains an ideal triangle, of which the tower is the apex ; and, knowing the length of the base-line and the value of the two angles at the ends of the base-line, he calculates by trigonometry the length of the two sides which express the distance of the tower from the ends of the base-line. Now, the astronomer, imitating this process, assumes as a base-line the known distance between two remote points on the earth's surface, as for example London and Cape Town ; and then, from each of these points he proceeds to take the bearings of the moon. The process, indeed, is here complicated by the fact that, owing to the long distance, the inequalities of the earth's surface, and its curvature, the observer at Cape Town cannot see the position of London, and *vice versa*. It is necessary, therefore, again to resort to an indirect method, and, having measured the meridional bearings of the moon from the north-pole at London and from the south-pole at Cape Town, to compare these bearings with the knowledge that the bearing of the one pole from the other is 180 degrees, or two right angles. A further correction must be made for the fact that London and Cape Town are not on the

same meridian. But disregarding these steps in the process, as unnecessarily complicating our case, we have to note that, when the astronomer has thus indirectly measured the angles which ideal lines drawn to the moon must make at the two ends of his long base-line from London to Cape Town, he is at once enabled, like the land-surveyor, to calculate by trigonometry the lengths of these ideal lines, and thus to ascertain the moon's distance. What, now, is the essential characteristic of the process which the astronomer goes through? Or, in other words, what is the fundamental psychical process by the manifold compounding of which is built up this highly-complex series of inferences?

From beginning to end, the fundamental process is the cognition of the equality of sundry relations. The thought which underlies and determines the whole calculation is the cognition that the relations between the sides and angles of a great triangle, having for its apex the moon, and for its base the chord of the arc of the meridian of London measured to a point in the Southern Hemisphere upon the same parallel with Cape Town, are equal to the relations between the sides and angles of a similar small triangle, having an inaccessible tower for its apex and a measured line of five or six rods for its base; and that these relations, in turn, are equal to the relations between the sides and angles of a still smaller and similar triangle which may be drawn on a sheet of paper, and of which the sides and angles may, if necessary, be directly measured. Now, this cognition implies the previous establishment, in the calculator's mind, of sundry cognitions of the equalities and inequalities of certain relations between the sides and angles of triangles. To show briefly how such cognitions have been established, let us cite the simplest case—that in which the two angles at the base of an isosceles triangle are recognized as equal to each other. Euclid establishes this point by supposing two similar and equal isosceles triangles, of which the one is turned over and placed upon the other, so that the apex and one side of the one will coincide with the apex and opposite side of the other. Then the other sides and the bases must respectively coincide, otherwise the two triangles would not be similar and equal, and the conditions of the case would

be violated. All the sides being thus equal, each to each, the two triangles must everywhere coincide, and consequently the two basal angles must be equal, both in the triangle which has been turned over and in the one which has kept its original position. Now, each step of this demonstration is a cognition of the equality of a pair of relations of length or of direction; and in each case this cognition is established, not by any anterior demonstration, but by direct inspection. Or, in other words, when it is said that two lines of equal length, starting from the same point, and running in the same direction, must coincide at their farther extremities, the truth of the statement is at once recognized *simply because the states of consciousness which we call the ideas of the two lines are totally indistinguishable from each other*. This immediate perception of the equality—or, in some cases, of the inequality—between two or more relations of position or magnitude is the goal toward which every geometrical demonstration tends. And, still more, it is the mental act implied in every step of every such demonstration. All the devices familiar to the reader of Euclid—the bisecting of lines and angles, the drawing of parallels and the circumscribing of circles for argumentative purposes—are simply devices for bringing a given pair of space-relations directly into consciousness, so that their equality or inequality may be recognized by direct inspection.

Manifestly the case is the same in that algebraic reasoning which our astronomer will often find it desirable to employ in the course of his computation of the moon's distance. The axiom that "relations which are equal to the same relation are equal to each other" is an axiom which twice involves the immediate recognition of the equality of two given relations. And, if any proof were needed that the whole science of algebra is based upon this axiom, it may be found in one of the most common algebraic artifices. "When a simplification may be thereby achieved, it is usual to throw any two forms of an equation into a proportion—a procedure in which the equality of the relations is specifically asserted." To cite Mr. Spencer's simple illustration: if we take any equation, $2xy = y^2$, and, dividing it by y , obtain a second equation, $2x = y$, the legitimacy of our proceeding is at once rendered apparent

when the two equations are thrown together in a proportion, in which it is asserted that the ratio of $2xy$ to y^2 is equal to the ratio of $2x$ to y . Or, if any doubt still remain as to the correctness of this, we resort to the familiar device of multiplying extremes and means, and obtain the identical proposition $2xy^2 = 2xy^2$, in which the identity of the two terms is immediately cognized, because the states of consciousness which they evoke are indistinguishable from one another.

Thus the complicated quantitative reasoning by which an astronomer determines the distance of a heavenly body consists in the long-continued compounding of immediate cognitions of the equality or inequality of two or more given relations or groups of relations of position and magnitude.

Before proceeding to unfold all that is implied by this conclusion, let us consider another concrete example of a somewhat different kind. When a certain horned animal, of slender figure, with cloven hoofs, and a hairy integument, is presented to the inspection of a naturalist, he at once recognizes it as a giraffe; and, if required further to describe it, he observes that, as having four stomachs, and chewing the cud, it belongs to the sub-order of ruminants; as having its toes firmly united in a solid hoof, it belongs to the order of ungulata; as having mammary glands and suckling its young, it belongs to the class of mammals; and, as having an internal bony skeleton, it belongs to the sub-kingdom of vertebrates. What, now, is the mental act which is repeated at each stage of this description? It is "a cognition of the fact that the relation between particular attributes in this animal is like the relation between homologous attributes in certain other animals." To confine ourselves to the first clause of the description—"the attributes implied by the term *ruminant* can be known only as previously observed or described; and the predication of these, as possessed by the animal under remark, is the predication of attributes *like* certain before-known attributes." Once more, there is no assignable reason why, in this particular case, a relation of coexistence should be thought between "such attributes as the possession of four stomachs and the possession of horns and cloven hoofs," unless as being *like* certain relations of coexistence previously known; and, whether the think-

ing of this relation can be otherwise accounted for or not, it is clear that the predication cannot otherwise have any probability, much less certainty."¹ The case is the same with the remaining clauses of the description. In each instance the mental operation performed by the naturalist is the recognition of the likeness between certain groups of relations observed in this giraffe and certain other groups of relations previously classified as pertaining to ruminants, ungulata, mammals, and vertebrates. Obviously, therefore, the reasoning by which the places of animals in the zoological scale are determined, consists in the compounding of cognitions of likeness or unlikeness between certain given groups of relations.

So far, then, the mental operation performed by the naturalist seems to be not unlike that performed by the astronomer. And indeed, in spite of the superficial difference which seems so widely to separate the classification of animals from the measurement of celestial spaces, it will appear, on a moment's reflection, that the only real difference between the mental processes involved in the former case, and those involved in the latter, is the extent to which *likeness* is predicated of the relations concerned. Deeply considered, the act of the astronomer is the same as that of the naturalist, save that, while the former classifies together sundry groups of relations as *equal* to another, or indistinguishable from one another, the latter classifies together sundry groups of relations as *like* one another, or but slightly distinguishable from one another. Now, in this statement we see that what is meant by *equality* is merely *exact likeness*; but something more is needed for the accurate description of the difference between the two cases. The objects which the astronomer contemplates are simple triangles, presenting simple relations of position and magnitude; while the objects contemplated by the naturalist are complex organisms, presenting immensely compounded relations of structure and function. Now, in speaking of simple things or simple relations, such as lengths and breadths, weights, times, and velocities, we habitually predicate *equality* or *inequality* of them. "Wherever the terms of the compari-

¹ Spencer, "Principles of Psychology," vol. ii., p. 69.

son, being both elementary, have only one aspect under which they can be regarded, and can be specifically posited as either distinguishable or indistinguishable, we call them either *unequal* or *equal*. But when we pass to complex things, exhibiting at once the attributes, size, form, color, weight, texture, hardness—things which, if equal in some particulars, are rarely equal in all, and therefore rarely indistinguishable—then we use the term *like* to express, partly the approximate equality of the several attributes separately considered, and partly the grouping of them in a parallel manner in time and space. Similarly with the relations involved in reasoning. If simple, they are recognized as *equal* or *unequal*; if complex, as *like* or *unlike*."

The essential difference, then, between the quantitative reasoning employed in the most advanced sciences, and the qualitative reasoning employed in those which are less advanced, may be thus stated: in the first case the relations contemplated are so simple that they may be directly juxtaposed in consciousness, and recognized as *equal* or *unequal*; but in the second case the relations contemplated consist of so many simple relations heterogeneously combined, that they can only through a very indirect process be juxtaposed in consciousness, and hence are only approximately recognized as *like* or *unlike*. That this is the only essential difference between quantitative reasoning and qualitative reasoning is shown by the fact that all qualitative reasoning is vaguely quantitative, while all quantitative reasoning begins by being qualitative. For example—to cite Mr. Spencer's admirable illustration—when a brewer describes a vat of fermenting wort as containing carbonic acid, he makes a qualitative statement; yet some rude notion of quantity is involved in it. "He thinks of the carbonic acid as more, certainly, than a cubic foot; less, certainly, than the total capacity of the vat: the quantity is thought of as in some ratio to the quantity of wort." On the other hand, "a man who has walked a mile in fifteen minutes, and, observing that he has a quarter of a mile still to go, infers the time it will take to reach his destination, does not primarily infer *three minutes and three-quarters*: he primarily infers *a short time*—a time indefinitely conceived as certainly less than ten min-

utes, and certainly more than one." Doubtless he may in an instant proceed to calculate the exact length of the time; yet, as it will not be denied that even before calculating he has a vague notion of the interval, it must be admitted that his inference, though ultimately quantitative, is, at the outset, only qualitative. Between the two kinds of reasoning, therefore, the only difference is the degree of definiteness to which they are respectively developed.

Bearing in mind these mutually harmonious conclusions—which alike imply the assertion that, between the highest and the lowest kinds of reasoning employed by civilized man, the difference consists solely in the complexity of the relations contemplated, and in the greater or less definiteness with which these relations are cognized as equal or unequal, like or unlike—let us now advance a step further. Already, in the course of the foregoing analysis, the essential similarity between reasoning and classification has been vividly brought before us. We have now to scrutinize this similarity somewhat more closely.

To cite an example with which we are already familiar: when our astronomer, some thirty years ago, observed that certain irregularities in the motions of Uranus still remained unaccounted for, after calculating the combined effects of all the interior planets in producing such irregularities, it occurred to him that the unexplained irregularities could only be due to the gravitative force of some undiscovered planet outside of Uranus; and the discovery of Neptune was the result of this most brilliant hypothesis. Now, the mental act involved in this deduction was essentially a *classification of cases*. The case of the unexplained perturbations was mentally ranked along with the several cases of explained perturbations presented by the solar system, as being similarly due to gravitative force; and to the number of known cases in which planets deflect each other from the regular paths in which they would otherwise move, a new hypothetical case was added. Comparing, now, this mental operation with that of the naturalist who, by virtue of certain observed likenesses of structure and function, ranks together lions, and elephants, and seals, in the class of mammals, we may conclude roughly

that the one process consists in the formation of a group of *like cases*, while the other consists in the formation of a group of *like things*. And since by the expression "like cases" we mean merely "like sets of relations among two or more given groups of things," it follows that we may characterize Reasoning as the *classification of relations*, while Classification, ordinarily so called, is the *classification of things*. When, for example, on perceiving two similar triangles set side by side, we proceed to make some inference from the known value of a side in the one to the desired value of the corresponding side in the other, the act is an act of reasoning. But when, on taking up two similar sea-shells, we recognize them in their totality as belonging to an oyster or some other familiar mollusk, the act is an act of classification, commonly so called. In other words, if the perception of similarity is followed by the thought of one or more of the like relations which make up similarity, we have an act of reasoning; but, if it is followed by the thought of other objects presenting like relations of similarity to the one now perceived, we have an act of classification.

But, closely related as these two mental operations are now seen to be, we have not yet disclosed the full extent to which they are related. Not only is classification involved in every act of reasoning or inference, but reasoning or inference is involved in every act of classification. Not only does reasoning consist in the grouping of relations as like or unlike, but the classification of things can go on only through the grouping of relations as like or unlike. To illustrate this, let us take a further downward step, and consider a mental operation apparently much simpler than those hitherto treated. Let us consider what is implied by the perception of an object.

It is admitted on all sides that the perception of an object necessarily implies the *recognition* of the object as this or that, as like certain objects, and as unlike certain other objects. Every act of perception, therefore, involves classification. We cannot even name a chair without implying the existence of a group of objects which the chair resembles; and the essential element in the perception of a chair is not the reception of a group of visual or tactual impressions, but the interpreta-

tion of these impressions as like other antecedent impressions which, taken together, constitute the consciousness of the presence of a chair. And this is as much an act of classification, as the act by virtue of which the naturalist would rank a newly-found horned and cloven-hoofed mammal among the ruminants; the only difference being that in ordinary perception the act has been performed so frequently as to have become automatic at an early period of life, while in scientific classification the act involves more or less conscious thinking, and comparison of relations.

Here, in this last clause, there is hinted what we are seeking for. Not only in scientific classification, but in ordinary perception also, there must go on a comparison of relations, and a grouping of them as like or unlike. In perceiving an apple, for example, "the bulk is perceived to be like the bulk of apples in general; the form like their forms; the color like their colors; the surface like their surfaces; and so on." For if the bulk were like that of a water-melon, or if the shape were cubical, or if the color were inky black, or if the surface were covered with thorns, the object would not be perceived to be an apple. The act of perception, therefore, consists in the recognition of sundry attributes as like sundry attributes previously known, and as having relations to one another like the relations between the before-known attributes. This will appear still more clearly, when we recollect what takes place in visual perception. It is well known that the eye, unassisted by the muscular and tactual senses, can take no cognizance of distance, shape, or solidity—the only impressions which the retina receives are impressions of color, and indirectly of superficial extension. It is because of this that infants reach out for the moon, and that blind men, on first receiving sight, are unable to distinguish between a round orange and a cubical block, without feeling the surfaces of the two. Only after repeated and careful comparison of visual impressions with muscular and tactual impressions is the patient enabled to discover, by the eye alone, that all the objects in the room or in the landscape are not in contact with his body; and it is only after a similar elaborate comparison that the young child achieves the feat of looking at an object in

a given direction, or of recognizing by vision its father or mother. Accordingly, when looking about the room, all that you really *see* is a congeries of colored spots. Your knowledge of the presence of divers objects—chairs, windows, mirror, mantel-piece—is not given in the act of vision, but is the result of an exceedingly complex, though apparently instantaneous, process of reasoning. Your seemingly immediate knowledge that a certain group of colored spots means a chair is due to the fact, that from early infancy this group of colored spots, or some other like group, has been associated with sundry impressions of touch and resistance, and with sensations yielded by the little muscles which turn the eye hither and thither. The frequency with which the association has been repeated has rendered the process of inference automatic, just as, to a less-marked extent, the process of reading, at first accompanied by a conscious classification of every letter, has become automatic, so that we are not aware of cognizing the letters at all. Nevertheless, although too rapid to rise into consciousness, the process is still one of inference, implying, like any other process of inference, the grouping of certain relations as like or unlike certain other relations. Certain correlated groups of colors are automatically classified with other correlated groups of colors previously received upon the retina, and also with certain correlated groups of muscular and tactual impressions, previously received simultaneously with the groups of colors in question. Thus our visual perception of objects consists of a group of sensations *plus* a complicated series of inferences which does not differ fundamentally from a course of scientific demonstration. And the same truth may be, with equal justice, though less vividly, illustrated in the case of any other sense than sight. A much simpler case than that of visual perception is that of a spoon, containing some unknown liquid, thrust into the mouth by another person in the dark. Here the only clew to the character of the liquid is its taste; and when, by its peculiar mild pungency, the liquid is recognized as bromide of potassium, the psychical process consists of a gustatory sensation *plus* an act of classification by which the sensation is grouped with other like sensations previously received. The example is a

good one, as showing us also the obverse case. If bromide of potassium has not been previously tasted, the result is simply gustatory sensation unattended by perception; or, rather, it is gustatory sensation generically classified as mildly pungent, but not specifically referred to any known liquid, and therefore only partially interpreted. There is perception, but it is incomplete.

It is not pretended that these psychological truths are established by the crude and fragmentary exposition here given. The numerous observations and experiments upon which they are based would be very interesting to recount; but our space does not admit of detailed proof, nor is it needed; since these truths are the common property of psychologists, and will be questioned by no competent student of the phenomena of mind. Referring, for minute and elaborate proof, to Mr. Spencer's "Principles of Psychology," let us be content with setting down the implication which is common to all those conclusions; namely, that between the various psychical processes thus far contemplated, which include alike the measurement of celestial distances by the astronomer, and the direct perception of objects by the unlearned child, or indeed by the ape or dog, there is generic identity. The fundamental characteristic which is common to them all is the reception of certain groups of sensations, accompanied by the classification of these groups of sensations, and of the relations between them according to their various likenesses and unlikenesses. The difference between the highest and the lowest of the processes thus brought together consists solely in the heterogeneity and definiteness of the groups which are classified, and in the extent to which the classifications are compounded.

To such a statement, however, there is one essential qualification to be added. It is not strictly correct to say that the classification involved alike in the most complex act of reasoning and in the simplest act of perception is a classification of groups of *sensations* and of the relations between them. For, when an object is perceived, along with the sensations actually present, there are remembered or internally-revived sensations which enter into the classification, and these inter-

nally-revived sensations are what we call ideas or images. For example, "when passing the finger over a rough surface, the perception contains very much more than the coördinated sensations immediately experienced. Along with these there go the remembered visual impressions produced by such a surface, which cannot be kept out of the mind, and in the suggestion of which the perception largely consists; and there are automatic inferences respecting the texture and density of the substance." So when we see an orange lying on the table, the only sensation actually present and entering into the case is the sensation of a patch of reddish-yellow color surrounded by other unlike patches of color. The other elements in the classification of which the perception consists are ideas or internally-revived sensations of position, shape, bulk, texture, juiciness, and so on. And now we discover another point of difference in degree between perception and reasoning. While in perception some of the elements classified must be sensations actually present, in reasoning *all* the elements classified may be ideas or internally revived sensations. The sides and angles of the isosceles triangles which the astronomer compares in estimating the moon's distance are ideal sides and angles; and the naturalist, in writing about the classification of ruminants, deals solely with internally-revived impressions of horns, hoofs, and multiple stomachs, which were previously present to sense. Thus the classification involved in reasoning differs from that involved in perception, not only in heterogeneity and definiteness, but also in *indirectness*. Nevertheless the difference is not fundamental, but is only a difference in degree; as is proved by the fact that alike in reasoning and in perception there is implied the previous reception of the actually present sensations of which the ideas or revived sensations are the copies. Our statement, therefore, will become strictly correct if we say that the fundamental characteristic common to the most refined reasoning, and the crudest perception, is the presence of certain *states of consciousness*, accompanied by the classification of these states and of the relations between them according to their various likenesses and unlikenesses; the differences between the processes being differences in heterogeneity, definiteness, indirectness, and extent of integration or compounding.

Let us next observe that, as between the highest and lowest kinds of reasoning there is a great difference in the extent to which the comparison of relations is carried, so between the highest and lowest kinds of perception there is a similar difference.

There is a striking contrast in degree of directness "between the perception that some surface touched by the finger is hard, and the perception that a building at which we are looking is a cathedral. The one piece of knowledge is almost immediate. The other is mediate in a double, a triple, a quadruple, and even in a still higher degree. It is mediate inasmuch as the solidity of that which causes the visual impression is inferential; mediate inasmuch as its position, its size, its shape, are inferential; mediate inasmuch as its material, its hollowness, are inferential; mediate inasmuch as its ecclesiastical purpose is an inference from these inferences; and mediate inasmuch as the identification of it as a particular cathedral is a still more remote inference resulting from the union of these inferences with those many others through which the locality is recognized." (Spencer, "Psychology," ii., 245.) From this example it appears that while, at the highest extreme, perception emerges into reasoning, on the other hand at its lowest extreme, as where a body is perceived to be rough or hard, it borders very closely upon simple sensation. Proceeding, then, a step further in our descending analysis, we have to examine the character of the difference between perception and sensation.

Sensation, no less than perception, has a variety of grades. At the one extreme it rises to a point where it is barely distinguishable from perception; at the other extreme it lapses into an unconscious or sub-conscious psychical state. While writing these lines the sum-total of my consciousness may contain elements contributed by dull sounds of persons walking overhead, by the rumbling of wagons in the street, by faint odors wafted from the kitchen, by soothing pulses of sensation from the pipe held in my mouth, and by the occasional striking of the clock, as well as by the pressure exerted by the chair in which I am sitting, and the table upon which my arm is resting, and the pen which is grasped in my fingers.

But, while I am absorbed in thought, none of these elements rise into the foreground of consciousness: though they are present as psychical states, as is shown by the fact that the going out of the pipe or the failure of the clock to strike is noticed, yet I become *conscious* of them, in the ordinary sense of the word, "only when they pass a certain degree of intensity," as when a child overhead falls on the floor, or when the shriek and rumble of a passing railway-train are added to the confused mass of out-door noises; "and only then can I be said to experience" these feelings "as sensations." But when a psychical state rises into the foreground of consciousness and becomes known as a sensation, as when my finger happens to touch the heated pipe-bowl, then "I not only contemplate the affection as an affection of myself—as a state through which my consciousness is passing or has passed—but I also contemplate it as existing in a certain part of my body—as standing in certain relations of position. I perceive *where* it is." The close relationship between sensation and perception is illustrated by this example: nevertheless psychology here distinguishes between two portions of the mental act. Though in the practical experience there is no separation between the two, yet analysis enables us to distinguish between the consciousness of the painful feeling and the consciousness of the presence of the heated object which causes the feeling; and the former of these we call sensation, while the latter we call perception.

We shall now be greatly assisted by observing a psychological fact of which Sir William Hamilton caught a glimpse, though, as usual, his analysis was not sufficiently thorough, and his statement of the case was inaccurate. We need not pause to criticise the theorem that while "perception proper and sensation proper exist only as they coexist, in the degree or intensity of their existence they are always found in an inverse ratio to each other;" for its inaccuracy has been fully demonstrated by Mr. Mill and also by Mr. Spencer, who shows the true statement to be, "not that sensation and perception vary inversely, but that they exclude each other with degrees of stringency which vary inversely." To illustrate this, we will suppose that you are running water from a

hot-water faucet, and that, as the water begins by running cold, you clasp your hand about the faucet so as to turn it off when the water has become sufficiently warm. While the water is cool or tepid, sensation is at the minimum, and not only is there no exclusion of perception, but consciousness is occupied with the outer phenomenon, the faucet and the running water, more than with the inner phenomenon, the feeling of temperature. The pointed end of the upright part of the faucet, and the protuberance where the horizontal piece is fitted upon it, awaken tactual sensations which coexist with the sensation of temperature, and the automatic comparison of these sensations which constitutes the perception of the faucet goes on unhindered. To concentrate consciousness upon the feeling of temperature requires a voluntary act of attention, induced by the desire to know how warm the water is getting. As the water becomes very much warmer, so as to be slightly uncomfortable, the perception of the faucet does not become gradually less vivid, but it tends to disappear entirely, and consciousness tends to occupy itself exclusively with the feeling of temperature. Only through a distinct voluntary effort can the perception be made to come into the foreground of consciousness. If, now, there comes a sudden spurt of very hot water, the tactual perception of the faucet is for the moment entirely excluded, and the perceptive act implied in the estimation of the degree of temperature is also expelled from consciousness, which is occupied entirely with the sensation of pain, inducing a violent withdrawal of the hand. Here sensation, reaching a maximum, has quite driven out the group of tactual perceptions, and even visual perceptions are to that extent held in abeyance, that for the moment they cease to occupy the attention. If, now, a piece of soap is taken from its dish, the newly-aroused group of sensations—of weight, hardness, smoothness, and the rest—exist in minimum intensity, and consciousness is occupied, not with them, but with the presence of the piece of soap: perception tends to exclude sensation.

“What, now,” inquires Mr. Spencer, “is the real nature of this mutual exclusion? Is it not an instance of the general fact that consciousness cannot be in two equally distinct states

at the same time; and that in proportion as the predominance of one state becomes more marked, the suppression of other states becomes more decided? I cannot know that I have a sensation without, for the moment, having my attention specially occupied with that sensation. I cannot know the external thing causing it, without, for the moment, having my attention specially occupied with that external thing. As either cognition rises, the other ceases." By the "external thing," Mr. Spencer does not mean the objective reality, but the group of phenomena which are referred to an existence outside of the organism. But we have already seen that, when consciousness is so occupied with such a group of phenomena that the result is the perception of an object, the psychical act involved is an automatic classification of sundry states of consciousness and of the relations between them, according to their various likenesses and unlikenesses. Thus we arrive at the distinction between sensation and perception. Impossible as it is to disentangle the two in practical experience, analysis yet distinguishes the former as an apparently elementary state of consciousness, while the latter is "a discerning of the relations between states of consciousness." According, therefore, as attention is directed chiefly to a conscious feeling or to the relations between a number of feelings, is now sensation and then perception predominant.

It remains to be observed that sensations, or—as we may otherwise call them—feelings, are either peripherally or centrally initiated. In other words, a feeling may either originate at the surface of the organism—as is the case with sensations of sight, hearing, smell, taste, and touch, and in the main with muscular and thermal sensations; or it may originate in the interior of the organism—as is the case with the sensations of hunger and repletion, and with certain muscular sensations, such as cramp; or, again, it may start from some group of nerve-centres, as is the case with those vague feelings which accompany more or less complex acts of perception and reasoning, and which, when they acquire a certain degree of prominence, we call emotions. By the inclusion of these states of consciousness, the term "feeling" covers a somewhat wider range of meaning than the term "sensation." Nevertheless

the current use of the word "feeling" to designate indifferently a sensation or an emotion bears unconscious witness to the fact that the two kinds of psychical state differ only in their modes of genesis and of composition. The contrast between a peripheral sensation, as of color or touch, and an emotion, is chiefly a contrast in degree of definiteness and of localization. But this contrast holds also between peripheral sensations and such vague internal sensations as hunger, which, being known as cravings, are assimilated to the lowest orders of emotion. From this difference in definiteness arises the fact that the peripheral sensations admit of being definitely grouped according to their relations of likeness and unlikeness, and thus afford the material for perception and reasoning; while emotional states admit no such definite grouping, but arrange themselves variously in clusters, the particular character of the cluster being determined by certain contemporaneous perceptions or ideal reproductions of past perceptions. For these reasons the ultimate psychological nature of emotion can be reached only through a synthetical interpretation which starts by recognizing the fact that, along with that classifying of conscious states which occurs in perception and reasoning, there goes on a recognition of certain states as pleasurable or desirable to retain in consciousness, and a recognition of certain other states as painful or desirable to expel from consciousness. Thus in practical experience emotions are, in however slight a degree, inseparably associated with perceptions and inferences, as the vague, internally-initiated feelings accompanying the definite peripheral feelings in the classifying of which the perceptions and inferences consist.

Looking back, now, over the region already traversed, we find that we have passed in review a large number of mental operations which differ immensely in complexity, some of them being performed only by the most highly-educated adult civilized men, while others are performed habitually by children, barbarians, and numerous animals inferior to man. Yet, amid all this diversity, our analysis has detected a fundamental unity. In spite of their vast differences in complexity, we have seen that all these mental operations are ultimately made up of the same psychical process. The grouping of the

relations among feelings is the elementary act which is repeated alike in each simple and direct act of perception, and in each complicated and indirect act of ratiocination. At the present stage of our analysis, therefore, the ultimate elements of mind would seem to be *feelings* and the *relations between feelings*. It remains to add that relations themselves must be secondary feelings due to the bringing together of primary feelings. We can know a relation only as some modification of consciousness resulting from some combination of the feelings directly aroused in us by inner or outer agencies; and such modification of consciousness must be itself a kind of feeling. For further illustration let us briefly mention the different relations in the order of their decreasing complexity, that we may note the fundamental relation involved in them all. The most complex relations are those of *similarity* and *dissimilarity*, as exemplified when we recognize the kinship between a thorough-bred race-horse and a Shetland pony, or the complicated divergences between a city and a village. Simpler relations are those of *cointension* and *non-cointension*, as when we perceive that two sounds are equal in degree of loudness, or that in grasping wood and in grasping marble the feelings of temperature are different in degree; of *coextension* and *non-coextension*, as when two lines or two areas are seen to be equal or unequal; of *cœxistence* and *non-cœxistence*, as when the yellow-reddish light reflected by an orange is regarded as accompanied by sweetness and juiciness, but not by viscosity; of *connature* and *non-connature*, as when greater warmth is mentally assimilated to less warmth, but distinguished from blueness or roughness. Now, underlying all these relations, and all mental processes whatever, is the relation of *likeness* and *unlikeness* between primary states of consciousness. Given the power of recognizing two feelings or conscious states as like each other, and two other feelings or conscious states as unlike each other, and we have the primordial process in the manifold compounding of which all operations of intelligence consist. Let us now take into the account the universally-admitted fact that consciousness is rendered possible only by ceaseless change of state—that a uniform state of consciousness is in no respect different from complete

unconsciousness. If our minds were to become spellbound, like the palace of the Sleeping Beauty, all our thoughts and feelings remaining fixed *in statu quo*, our conscious existence would be practically at an end. For consciousness to exist at all, it is necessary that a given state should be followed by a different state. But this is not all that is required. A succession of feelings, of which no two were alike, would not give rise to consciousness, since the recognition of any feeling implies its classification with some antecedent like feeling. Consciousness, therefore, "is not simply a succession of changes, but an *orderly* succession of changes—a succession of changes *combined and arranged* in special ways." Thus we reach the law of the composition of mind. Since intelligence cannot arise or continue unless consciousness is continually passing from one state into a different state, it follows that there must be a continuous *differentiation* of states; and again, since intelligence cannot arise or continue unless particular states of consciousness are continually known as like certain previous states, it follows that there must be a continuous *integration* of states. Alike in the most rudimentary perception and in the most developed reasoning, the essential process is the separation of the unlike and the bringing together of the like. So that, "under its most general aspect, all mental action whatever is definable as *the continuous differentiation and integration of states of consciousness*," and the kind of mental action is regarded as high or low, according to the greater or less extent to which the differentiation and integration are carried. The phenomena of conscious intelligence are thus seen to conform to the universal law of evolution; and we may further note that this conclusion is entirely in harmony with the definition of psychical life as the continuous adjustment of inner to outer relations. For clearly, when an intelligence is developing in the midst of a complex environment, the greater the number of subjective relations which are adjusted to objective relations, the greater will be the extent to which the differentiation and integration of conscious states will be carried.

Here we may seem to have arrived at a satisfactory conclusion of our analysis. But the lowest depths of the problem

yet remain to be sounded, as will be seen when we consider a superficial objection not unfrequently urged against the foregoing views. Alike in all the mental operations which have formed the subject-matter of our analysis, we have seen that the relations of likeness and unlikeness entering into the case are classified with certain other relations of likeness and unlikeness previously cognized. The thought which determines the astronomer in calculating the moon's distance, implies previous experience of triangles and of numerical relations. In the classification of a giraffe there is implied previous acquaintance with the complex relations of structure and function connoted by the terms *ruminant*, *ungulate*, *monodelphian*, *mammal*, *vertebrate*, and *animal*. The perception of an apple implies numerous antecedent experiences of color, size, configuration, smoothness, odor, and taste. And in like manner, though we have provisionally defined a sensation as an "elementary state of consciousness," yet we have also seen that, in order to become truly conscious of a sensation, we must know it, or, in other words, must classify it with some like sensation previously felt. In short, we have seen that there can be no *cognition*, of whatever order, which is not a *recognition*, necessarily implying some previous combination of psychical states. How, then, it is asked, can there be any first cognition? How can intelligence ever begin at all, if the first and simplest intelligent act implies a reference to experiences which, in accordance with the theory, must have preceded any intelligent act?

Formidable as this objection may seem, and unanswerable as it would have been, if urged half a century ago, it has today no force whatever; and those who now deliberately urge it succeed only in betraying their entire lack of acquaintance with the progress which psychology has made since the times of Reid and Stewart. As long as psychological questions were settled simply by introspection—by observing what goes on in the consciousness of adult civilized man—the objection here cited must have seemed conclusive. But familiarity with the conception of evolution has now led us to regard things in general, not as coming at once into fulness of being, but as gradually beginning to be; and in the case of the phenomena

of intelligence, this view of the question is amply justified by experiments in objective psychology presently to be mentioned. The conception of an absolutely first cognition, not determined by previous psychical states, rests upon a fallacy similar to that upon which rested the preformation theory in biology. Just as it was formerly held that the embryo started as a fully-developed organism, differing from an adult organism only in size, so the objection which we are now considering involves the hypothesis that the earliest cognitions of an infant are like those of an adult in point of definiteness, the only difference being in the quantity of them. The latter hypothesis is as contrary as the former to the doctrine of evolution, and it is quite as decidedly negatived by the observation of facts. For, let us observe what is implied by the acquiring of a definite cognition by an infant. If the foregoing analysis be taken as correct, it is obvious that when any object, as an orange, is first presented to the mind of an infant, it cannot be perceived or identified as an orange. Before this intellectual feat can be achieved, there must go on for some time that complicated grouping of visual, tactual, and gustatory sensations above described. In accordance with the established theory of vision, we must admit that, when the orange is held before the child's eye, the only sensation aroused is that of a reddish-yellow color, which cannot even be perceived to be round until after it has been associated with sundry tactual sensations. But this is not all. Not even the sensation of a reddish-yellow color can acquire definite shape in consciousness, until sensations of blue, or red, or green, or white color, have been aroused, with which it can be contrasted, and until a subsequent like sensation of reddish-yellow color has been aroused to which it can be assimilated. Observe, now, the position into which we are brought. We are obliged to hold that the first sensation of orange-color cannot, strictly speaking, exist as a sensation at all; while, nevertheless, a subsequent sensation of orange-color (not, in any actual case, the second, but the twentieth or hundredth) occurring after intervening sensations of blue or green, can acquire definite shape as a sensation by being compared with this first sensation which is not strictly a sensation. Obviously, then, though the first

presentation of orange-color cannot awaken a visual sensation which can be known as such, it must produce some psychical state which is real, though not known. For if no psychical state were produced by the first presentation, then the second, or twentieth, or hundredth presentation could no more awaken a definite state of consciousness than the first. We are thus led to the assertion that states of consciousness may be produced by the differential grouping or compounding of psychical states which are beneath consciousness.

Now, this conclusion, which admirably explains the beginnings of conscious intelligence in the young child, is completely confirmed by experiments lately made with reference to the continuous genesis of sensations in the adult. Not only does the infant frame its earliest conscious sensations by the compounding of unconscious or sub-conscious psychical changes, but in every sensation of sound, color, odor, taste, or touch, which the adult receives, there is a precisely similar formation of a conscious state by the compounding of unconscious or sub-conscious psychical states. In the case of sound, the evidence for this statement amounts to complete demonstration; the evidence is hardly less strong in the case of sight; and, in the case of the other senses, all the evidence thus far obtained points toward the same conclusion. Let us first examine the composition of a sensation of sound, as admirably elucidated by M. Taine in his recent treatise on "Intelligence."

In musical sounds three characteristics are to be distinguished—loudness, pitch, and quality or *timbre*. The first of these, the loudness, depends upon the amplitude of the atmospheric waves by which the sensation of sound is caused. A series of sound-producing waves, like any other series of waves, has its elevations and depressions, and the height of the elevation above the depression is called the *amplitude* of the wave. The loudness of the sound varies as the square of the wave's amplitude. From this it follows that every elementary sound has a period of minimum intensity, answering to the wave's minimum amplitude when it is just beginning to rise; secondly, a period of maximum intensity answering to the wave's maximum amplitude when it has risen to its greatest height; and, thirdly, a period of minimum intensity, answering to

the wave's minimum amplitude when it has sunk nearly to the level again; while between these minima and the maximum there are many varying degrees of loudness. In other words, every elementary sound is at first faint, then gradually becomes loud, then grows fainter, till it disappears. Now, note what happens when elementary sounds are made to succeed each other. If the succession be irregular, there is a mere chaos of noises—a case with which we need not here deal. But if the succession be regular, and steadily increase in rapidity, there follows a remarkable series of results. As long as the waves or pulses answering to the elementary sounds succeed each other slowly, the sounds are distinguishable from each other as raps or puffs, according to the instrument employed, and each has its maximum and its two minima of intensity. But, when the waves begin to strike the ear at the rate of about sixteen in a second, the consciousness of separate raps or puffs becomes evanescent, and there arises the consciousness of a continuous tone of very low pitch. That the consciousness of the separate sounds has not quite ceased, and that the continuousness of the tone which they compose is not complete, are shown by the fact that the maxima and minima are still perceived. In the deepest bass-notes of an organ, for example, the pulsations are clearly distinguishable—a fact which proves that we are conscious of the effects answering respectively to the protuberances and to the hollows of the waves. Now, the pitch of a tone depends upon the rapidity with which the waves succeed each other, and, therefore, upon their length, or the distance between two successive hollows, because as the waves come faster they grow shorter. The shorter the waves, the higher the pitch. Hence, as the pitch rises, the protuberance of any wave approaches nearer and nearer to the protuberances of the waves immediately behind it and in front of it, and the maximum intensities of sound which answer to the protuberances become crowded together in consciousness. The result is that, after a while, the maxima and minima are no longer distinguishable by the ear, so that by no effort of attention can we discern the elementary pulses of which the tone is composed. The tone asserts itself to be completely homogeneous. All that mere

introspection could discover in consciousness would be an apparently simple sensation of musical tone. Yet into the composition of this sensation there enter a thousand or several thousand psychical states answering to the presence of as many elementary sounds with their maxima and minima of intensity. And if any one of these elementary sub-conscious psychical states were absent, the character of the conscious sensation would be different from what it is.

But this is not all. Every musical tone has a *timbre* or quality of its own, according as it proceeds from a piano, a violin, a flute, or any other instrument. Now, Helmholtz has proved that the quality of any tone is due solely to the number and combinations of certain higher and fainter tones which accompany it. Along with the fundamental note there are heard sundry harmonic notes, due to vibrations from two to ten times more rapid than those which constitute the fundamental note. When any note is sounded on the piano, the first six harmonics are sounded with it; when the same note is sounded on the violin, by means of the bow, the first six harmonics are sounded so feebly as to be overpowered by the seventh, eighth, ninth, and tenth; and this is the only cause of the difference in quality of tone between the piano and the violin. Now, by an effort of attention these harmonic overtones may be recognized as distinct sensations when two or three notes are slowly struck. But in ordinarily rapid playing they are not distinctly recognized. Their only effect is to impart to the tones that peculiar quality which enables the ear to recognize the instrument from which they emanate. Thus our apparently simple sensations of musical sound are enormously complex. When *F-in-alt* is sounded on the violin, there are produced, in the course of a single second, several thousand psychical states which together make up the sensation of pitch, fifty-five times as many psychical states which together make up the sensation of quality, and an immense number of other psychical states which together make up the sensation of intensity. These psychical states are not, in any strict sense of the term, states of consciousness; for, if they were to rise individually into consciousness, the result would be an immense multitude of sensations, and not a single homogeneous

sensation. There is no alternative, therefore, but to conclude that in this case a seemingly simple state of consciousness is in reality compounded of an immense multitude of sub-conscious psychical changes.

Returning, now, to what we have called the elementary sound, by the manifold compounding of which all cognizable tones, qualities, and intensities are built up, we shall the more readily yield to the evidence which shows that even this primitive unit of sound is not elementary. For, as M. Taine observes, each so-called elementary sound, in passing from its minimum to its maximum, passes through an infinite series of degrees of intensity, and, unless there were some psychical modification corresponding to each increment of intensity, there would be no state of consciousness answering to the total rise from the minimum to the maximum. Again, while, for simplicity's sake, we have assumed that each of the raps or puffs which occur too slowly to be heard as a single tone of lowest pitch is heard by itself as an elementary sensation, this is not strictly true. For the so-called simple sensation must be either a sensation of musical tone or a sensation of noise. In the former case its composite character has been already shown. In the latter case, in the sensation of noise, rap, or puff, the truly primitive elements are sub-conscious psychical states answering to successive waves of unequal lengths. Any one of these waves by itself will not produce a genuine state of consciousness; it is only by compounding the sub-conscious psychical affections which they severally produce, that we obtain the so-called elementary sensation of noise or rap.

In every way, therefore, the conclusion is forced upon us that every one of our apparently simple auditory sensations is made up of a vast multitude of psychical affections, of which the really simple ones would never arise into consciousness save by being joined with others. Our simplest cognizable sensation of sound is in reality a compound of the fourth or fifth, or even of some higher, order.

In the case of visual sensations the same conclusion is reached by a precisely similar argument, sensations of color differing from those of sound only as answering to wave-

lengths immeasurably shorter and more rapid in succession. It is unnecessary to insist upon the manifold analogies between sound and light, which are each day brought more vividly before the attention of the physical inquirer, as, for example, the wonderful but plausible hypothesis lately propounded, that all the lines in the spectrum are simply the harmonic overtones of a fundamental color, which, being a couple of octaves below red, is itself invisible. Restricting our statement to ascertained points of resemblance, it may be said that the argument from the phenomena of musical pitch applies step by step to the phenomena of color as we rise in the scale from red to violet; the only difference being that, as the slowest vibrations which the eye receives occur at the rate of about four hundred millions of millions in a second, we cannot experimentally distinguish, as in the case of the lowest sounds, the seemingly elementary sensation which answers to each couple of vibrations. Nevertheless, from experiments with the electric spark it has been shown that a sensation of light which endures for one second is composed of at least a million successive sensations, each one of which, if separately excited, would rise into consciousness and be recognized as a flash of light. Now, as this flash of electric light is cognized as white, it follows that the cognizable sensation which lasts for one-millionth of a second is really made up of at least three sub-conscious psychical states, which, if they were severally to rise into consciousness, would be severally cognized as red, green, and violet flashes—these being the primitive elements of which the consciousness of white light is composed. This fact alone shows that the method by which a sensation is formed out of sub-conscious psychical changes is essentially the same in the eye and in the ear.

No such elaborate investigations have been made with reference to the other peripheral sensations. Yet, in the cases of smell and taste, the argument is not essentially different from what it is in the cases of hearing and vision. The physical antecedent, either of smell or taste, is a chemical reaction between particles of the odorous or sapid substance, and the ends of the olfactory or gustatory nerve-fibrils. Now, a chemical reaction implies an enormous number of undulatory move-

ments by which myriads of molecules are seeking to reach a position of equilibrium. Accordingly, the end of the nerve-fibrils in the olfactory chamber or in the tongue must be rapidly smitten by little molecular waves, just as the auditory filaments are smitten by atmospheric waves; and thus there is indicated a course of argument similar to that employed in the case of sound. It may be fairly argued that if each wave does not produce some sub-conscious psychological effect, the sum of the waves will not produce a state of consciousness known as smell or taste; so that here too the seemingly primitive sensation is really derivative and compound.

M. Taine's argument with reference to the tactile sensations is singularly beautiful, but no room is left for more than the briefest allusion to a few of its salient points. All tactile sensations are either dermal or muscular; that is, they are due, either to disturbances of nerve-fibrils embedded in the skin, or to disturbances of nerve-fibrils embedded in the extremities of the muscles lying under the skin. In the first case, the sensation is either of contact or of temperature; in the second case, there is a sensation of resistance or pressure; and in both cases, when the sensation proper to the nerve is prolonged or intensified beyond a certain degree, it is at first accompanied and finally supplanted by a sensation of pain. Now, Weber's experiments have shown that these differences in sensation are not due to the excitation of distinct nerves, but to the differently-combined excitation of the filaments of the same nerves. The difference between the sensation of contact and the sensation of temperature depends upon the order in which the filaments of a particular nerve are set in vibration. And thus, as Fick observes, we may understand why it is difficult to distinguish between a prick from a needle and a minute burn from a spark of fire; for the nearer we approach to a truly elementary sensation, the more evanescent becomes the distinction between the compound sensation of temperature and that of mechanical contact. On the contrary, when a larger area of skin is suddenly rubbed or burnt, so that enough nerves are brought into play to compound the elements of the sensations, then there is no difficulty in distinguishing the feeling of temperature from that of mechanical contact. From these and

many other kindred facts, to which scanty justice is done by this cursory allusion, M. Taine very plausibly concludes that our ordinary tactile sensations are made up of little component psychical affections differing only in number, order, and duration; while, according as these elementary psychical states are differently compounded, they form conscious sensations which, as presented to consciousness, seem to be severally simple and distinct in kind.

Throughout this remarkable analysis questions are suggested which can be completely answered only when physics and chemistry, as well as physiology and psychology, are much more advanced than at present. Yet there are three important principles which we may regard as established in the case of sound, and as clearly indicated in the case of the other sensations. The *first* is, that sensations which are apparently simple and elementary, and which cannot be analyzed by mere observation of consciousness, are nevertheless compounded of many successive and simultaneous sensations, which are themselves compounded of still lower psychical affections. The *second* is, that two sensations, which differ only in the mode in which their elements are compounded, may appear in consciousness as generically different and irreducible to each other. The *third* is, that two or more psychical affections which, taken separately, are as non-existent to consciousness, may, nevertheless, when taken together, coalesce into a sensation which is present to consciousness. And when these three conclusions are presented in a single statement, they become equivalent to the conclusion above obtained from examining the beginnings of conscious intelligence in an infant; namely, that states of consciousness may be produced by the differential grouping or compounding of psychical states which are beneath consciousness.

This result is in entire harmony with what might be inferred *a priori* from the known characteristics of nerve-action. Whether in the gray substance of ganglia, or in the white substance of nerve-fibres, the physical action which accompanies psychical changes is an undulatory displacement of molecules resulting in myriads of little waves or pulses of movement. From this fact we might have suspected that, as a cognizable

state of consciousness is attended by the transmission of a number of little waves from one nerve-cell to another, so the ultimate psychical elements of each conscious state must correspond to the passage of these little waves taken one by one. And this inference, which by itself would be only a plausible guess, is raised to the rank of a scientific hypothesis by its harmony with the results of the analysis above sketched.

Thus we are led to infer, as the ultimate unit of which Mind is composed, a simple *psychical shock*, answering to that simple *physical pulsation* which is the ultimate unit of nervous action. By the manifold and diverse compounding of myriads of such primitive psychical shocks, according to the slight structural differences of different nerves, are formed innumerable elementary sensations, which appear to be generically different; just as *aqua-fortis* and laughing-gas, which seem generically different, yet differ really only in the proportions of nitrogen and oxygen which compose them. By a similar differential compounding of these elementary sensations, we get complex sensations of blueness and redness, warmth, pressure, sweetness, roughness, and of various kinds of *timbre* and degrees of pitch. Carrying still further the same process of differentiation and integration, we rise step by step to perceptions of greater and greater complexity, to conscious classifications, and to reasoning in its various forms, from the crude inferences of the child, barbarian, or boor, to the subtle and indirect combinations of the artist and the scientific discoverer. Thus, amid all their endless diversities, we discern, though dimly, a fundamental *unity of composition* throughout all orders of psychical activity, from the highest to the lowest.

Near the close of his first edition of the "Origin of Species," Mr. Darwin predicted that the establishment of his theory would eventually place the science of psychology upon a new basis—that of the acquirement of each mental faculty by slow gradations. We seem now to have fairly started upon the path which leads to this desired goal. For, while, among the mental operations, above analyzed, some are peculiar to the highest human intelligence, there are others which are shared by the highest and the lowest human intelligence. Others—as the simplest inferences, several complex perceptions, and all

the most simple ones—are shared by all human intelligence with the intelligence of apes, dogs, horses, and indeed of the majority of mammals, many birds, and possibly some lower animals. Others, again—as the simplest perceptive acts implied in recognizing a sensation—must be shared with all those animals whose nervous system is sufficiently complex to allow of their having any consciousness whatever. While others, finally—as the simplest sub-conscious groupings of primitive psychical shocks—must be shared by humanity with all those forms of animal existence which possess any nervous structure whatever. For instance, that reflex action which occurs when the foot of a sleeping person, casually moved into a cold part of the bed, is quickly withdrawn without arousing any state of consciousness, involves the activity of a fragment of the human nervous system which corresponds in general structure to the entire nervous system of a medusa or jelly-fish. In such lowly creatures, then, we must suppose that the psychical actions which go on are similar to our own sub-conscious psychical actions. And, clearly, if we could trace the slow increments by which the nervous system has grown in heterogeneity, definiteness, and coherence, during the countless ages which have witnessed the progress from the primeval marine vertebrate to the civilized modern man, we should also be able to trace the myriad stages of the composition of mind, from the reflex contractions of a rudimentary fin, up to the generalizations of an Aristotle or a Newton.

ART. II.—*Some Medical Questions of the Lawler-Will Case.* By ROBERTS BARTHOLOW, A. M., M. D., Professor of Materia Medica and Therapeutics in the Medical College of Ohio; Lecturer on Clinical Medicine, and Physician to the Hospital of the Good Samaritan, etc.

IN November, 1868, I published a preliminary note on the case of the late Davis B. Lawler, of Cincinnati.¹ As at this

¹ "Case of Davis B. Lawler—Amnesia of Written Language; Vertigo; Unequal Pupils; Intermittent and Irregular Pulse; Death; Autopsy."—*Lancet and Observer*, November, 1869.

time legal measures had been taken to contest the will of Mr. Lawler, I contented myself with the merest statement of facts, reserving for a future occasion a fuller consideration of the many interesting medical and medico-legal questions involved in the case. After a protracted legal contest, in which some of the ablest members of the Cincinnati bar were engaged, the jury rendered a verdict declaring Mr. Lawler incompetent to make the codicils in question. I may now, therefore, without impropriety, put into execution my original design. Also the fact that many of the statements made in my first note were called in question by *experts* summoned by the defendant of the will, may be considered an additional reason for a further examination of the case.

HISTORY.—Mr. Lawler died at eighty-two, without issue, leaving an estate valued at five hundred thousand dollars. As his health had been feeble for many years, and as he expected his wife to survive him, he made a will devising to her the whole of his estate, except some minor legacies. Subsequently, he added codicils, bequeathing to his wife's German relatives the bulk of his property; giving to some friends of his wife and to certain distant relatives of his own, smaller, but yet considerable sums, and cutting off with nominal bequests his immediate relatives. As Mr. Lawler survived his wife seven months, the legal contest was in regard to his testamentary capacity at the time when the codicils were made which disposed of his estate.

The codicils were executed on the 17th of October, 1867. A month previous to this Mr. Lawler, then a very feeble man, experienced a severe fall, which was followed by serious symptoms. This fall was sufficiently severe to have caused bruising of the head and face, and great confusion of mind. When he recovered from the immediate effects of the injury, it was ascertained that his mental faculties had suffered decided impairment. Thus, he had lost the knowledge of written or printed characters; was unable to play chess, to which he had previously been much devoted; forgot persons and places, before perfectly familiar, and could not remember, even when distinctly described, certain pieces of real estate of great value which he owned. The codicils were executed when he was in this state of impaired mental power.

In order to arrive at a satisfactory conclusion in regard to his testamentary capacity, it will be necessary to ascertain what manner of man Mr. Lawler was before the injury referred to; to contrast his normal with the abnormal condition subsequent to the fall; and to compare the symptoms observed during life with the alterations of structure found on post-mortem examination. Proceeding in this way, the very interesting medical questions which the case has developed may be examined into as they arise.

Mr. Lawler possessed, by nature, fine powers of mind. His experience in life was very varied. He commenced his career as a merchant in Archangel, where he met and married his wife. Failing in business there, he returned to the United States and engaged in mercantile pursuits in Cincinnati, where he resided until his death—a period of nearly fifty years. During this time he visited Europe twice. His journals, now before me, kept with remarkable neatness and precision, disclose the keen observer, and the man of taste and cultivation. His house contained many fine pictures and objects of art. He was a thinker, and had strong opinions on many points. When eighty years of age he purchased, for his own perusal, Lecky's "History of Rationalism" and Fiquier's "The World before the Deluge." At great expense he procured abroad, and had transported to Cincinnati, a sphinx which he placed on his burial-lot in Spring Grove Cemetery. Disbelief in revealed religion, and a lack of faith in human nature, were prominent characteristics of Mr. Lawler's moral constitution. He subjected every thing to the test of reason, and was little, if at all, influenced by feeling.

Mr. Lawler paid great attention to the gold and stock markets, read with assiduity the newspaper reports, and watched the fluctuations in value with keen interest. He was a great reader of newspapers, and kept himself well informed in regard to current events and social and political movements. He was very accurate in his knowledge, precise in his language, and possessed a vocabulary which must have been exceedingly rich, for, even when his mind was impaired, he often employed unusual words with a remarkable nicety of discrimination. Up to the time of his fall in September, 1867, Mr. Lawler was an

ardent chess-player, and every evening formed one of a chess party at his house. It was one of his peculiarities to observe closely every day the state of the atmosphere. Whether travelling in the freezing winds of North Russia, or sauntering in the balmy air of the Riviera, or ascending the Righi, or visiting the Louvre, he makes constant references in his journal to the weather, and we catch glimpses of the irritability of a nervous system susceptible, in an extreme degree, to thermic changes. Variations in temperature affected Mr. Lawler, because he was a martyr to neuralgia for forty years. During his European tour in 1840-'41 he alludes in his journal to attacks of pain which prevented him accompanying his party on interesting excursions.

Mr. Lawler inherited the gouty constitution, and to this diathesis with its concomitant changes was the neuralgia chiefly due. The neuralgia began at that period in his life when, owing to the influence of his inherited predisposition, bodily decay had already begun. He was about forty years of age when these pains began, and toward the end of his life they increased in severity *pari passu* with the structural alterations of old age. All authorities recognize the influence of senile degeneration in the production of neuralgia. The first evidences of these changes are atheroma of the arteries, and sometimes the *arcus senilis*.¹ In the succeeding ten years other changes became manifest, indicating progress in senile degeneration. An intermittence in the pulse and irregularity in the force and volume of the pulsations were distinctly recognized when Mr. Lawler was about fifty years of age. That he should continue to enjoy freedom from many of the disabilities growing out of cardiac disease, is by no means unprecedented. He led a very quiet life, was regular in his habits, and was subjected to no powerful emotional disturbances. Under these circumstances, as is now well known, very serious heart-mischief may be carried for many years. Fortunately, from the period when degenerative changes in the cir-

¹ Anstie, "Neuralgia and the Diseases that resemble it," p. 23. London, Macmillan & Co., 1871.

Axenfeld, "Des Névroses," p. 162. Paris, Baillière, 1868.

Eulenburg, "Lehrbuch der functionellen Nervenkrankheiten," p. 53. Berlin, Hirschwald, 1871.

culatory system began up to the time of his death, a space of nearly forty years, Mr. Lawler had a good appetite, good digestion, and a nice balance in his assimilation, so that his body-weight was maintained at a uniform level.

During the year 1867, Mr. Lawler had various attacks of vertigo, in one of which he fell from his seat while engaged in a game of chess. In September of the same year, he suffered a violent fall, bruised his head and face, and did not recover consciousness for several hours. After this attack, it was ascertained that he had lost the faculty of language so far as regards written characters, and was unable to play chess, etc.

MR. LAWLER'S PHYSICAL AND MENTAL STATE, AS OBSERVED BY
MYSELF.

My attendance on Mr. Lawler began six months after the fall above referred to, and continued until his death—a period of sixteen months. During this time I had frequent opportunities for observation of his physical and mental state, and was enabled to complete the medical history of the case by post-mortem examination. In giving an account of my observations, I shall take occasion to reply to the criticisms of the experts¹ who testified at the trial in opposition to my original statements.

Mr. Lawler presented the ordinary characteristics of advanced age. His hair was thin and white; body spare; hands tremulous; walk titubating; skin dry and wrinkled, and the superficial veins of the hand turgid and dark blue. His special senses were impaired. He was not deaf, but his sense of hearing was obtuse. Vision in the right eye was normal for his age, and, aided by suitable glasses, he had no difficulty in the perception of objects. The reflex and accommodative movements of the right eye were normal. The pupil of the left eye was dilated and immovable, but vision was good, as I ascertained by repeated examinations. A faint opacity was detected in the lens, but this was not sufficient to cut off the visual rays, for Mr. Lawler affirmed that he could see as well with the left as with the right eye. The dilatation and immo-

¹ I have in my possession for this purpose the phonographic reports of the testimony.

bility of the left pupil were hence attributed to intra-cranial lesion. This opinion was made the subject of adverse criticism by the experts,¹ who maintained that the state of the pupil was due to the slight and "commencing opacity" of the lens, and was not determined by any presumed cerebral disease! In this, as in other matters, the experts lost no opportunity to differ from myself—a witness to fact—whenever the subject in question admitted either of misconstruction or adverse opinion.

The sense of taste was enfeebled, but not abnormal; the tongue was clean, and its motility unimpaired.

A marked irregularity in his pulse was at once observed. At varying intervals there was a full and strong pulsation, followed by a variable number of small and very irregular beats, and each of these latter differed from the others in volume and force. An interval then occurred, to be succeeded by a full pulsation, and a number of smaller and irregular beats, as just mentioned. These peculiar qualities are well exhibited in the subjoined tracing, taken by Marey's sphygmograph. This tracing was made at a favorable time, when Mr.

FIG. 1.



Lawler was comparatively free from vertigo, and was able to sit up. Without stopping to comment on the indications afforded by this trace, which indeed are apparent enough, I pass on to answer the singular criticisms made by the expert, Dr. C. G. Comegys. In my original paper I assumed that the tracing, besides the obvious irregularity in the action of the heart, indicated atheroma of the artery. Dr. Comegys maintained that such a degree of atheroma as I described would give a pulse-wave of very small amplitude, and he exhibited to the jury, in support of his opinion, a tracing which he considered typical, its chief characteristic being the smallness of the wave-line. Now, as in Mr. Lawler's case there existed a condition normal, so to speak, to the atheromatous degenera-

¹ Dr. C. G. Comegys and Dr. John Davis.

tion, viz., hypertrophy of the heart, it is plain that the sphygmographic trace should possess a certain amplitude. Indeed, we find this to be the case in the tracings given by Marey¹ himself, by Jaccoud² and others. Opposed to Dr. Comegys was Dr. Carson, an intelligent and reliable expert, summoned to testify on the same side, who submitted to the jury the sub-

FIG. 9.



joined tracing in support of his own opinions. This tracing presents a greater amplitude than that of Mr. Lawler, and differs from the latter in the regularity of the pulsations. *Cæteris paribus*, the size of a pulse-wave will be largely influenced by the spring-pressure; hence, we may conclude that Dr. Comegys's typical example represents not so much an unyielding arterial wall as too great spring-pressure to permit the proper expansion of the vessel. As the autopsy disclosed a very advanced calcareous degeneration of the aorta, and of the larger cerebral vessels, Dr. Comegys assumed that my account of these changes, or my tracing, was incorrect. He thus seemed to be oblivious of the fact that usually the radial artery is by no means so far advanced in the mineral degeneration as the aorta and the cerebral vessels. No higher authority on this point can be quoted than Rokitsansky,³ who states the relative order in which atheromatous degeneration takes place in the arterial system, as follows: aorta, splenic femoral, iliac, coronary arteries of the heart, arteries of the brain, uterine, subclavian and brachial, etc. It is evident that, however far advanced the aorta may be in calcareous degeneration, the radial artery may be but slightly changed from the normal.

Drs. C. G. Comegys and John Davis further attempted to discredit my statements in regard to the extent to which the

¹ "Physiologie Médicale de la Circulation du Sang," Paris, 1863; also, "Archives de Physiologie," tome ii., 1869, p. 61, *et seq.*

² "Traité de Pathologie Interne," Paris, 1870, tome i., p. 647.

³ "Pathological Anatomy," vol. ix., p. 204, American edition.

atheromatous change in the arterial system had proceeded, by affecting to discover an inconsistency between the two facts of advanced calcareous changes, and the "maintenance of the bodily nutrition at a uniform level." These experts seemed not to be aware of the fact that the vessels supplied to the organs of vegetative life are the very last to be invaded by this degenerative process. It will suffice to quote on this point a single sentence from Rokitansky :¹

"It is worthy of notice that certain arteries are only very rarely, and in exceptional cases, subject to even a subordinate degree of this disease; among these we may reckon the mesenteric arteries, and yet more the coeliac, the gastric, the hepatic, and the epiploic."

The cardiac valves were subjected to the same changes as the arteries. In my first note I made the following observations on this point :

"The physical signs are in accord with the sphygmographic trace. A loud, double-bellows murmur is audible at the base of the heart, and thence propagated in both directions. I therefore diagnosticate obstruction and regurgitation at the aortic orifice, and also mitral insufficiency. The evidences of calcareous degeneration, as furnished by the state of the radial arteries and the *arcus senilis*, indicate that similar changes have taken place in the cardiac valves on the left side. As the irregularity of the pulse has been observed, according to Mrs. Lawler, more than twenty years, it does not appear what relation exists between the changes in the valves and the altered rhythm of the heart's movements. It is probable, however, that the calcareous degeneration has preceded the irregularity of the pulsations."

The following is the report of the condition of the heart as ascertained on post-mortem examination :

"Most extensive calcareous degeneration existed throughout the arterial system (so far as examined). The aorta was hard, brittle, and chalky in color, and large calcareous plates could be detached from its serous lining. The semilunar valves of the aorta were extensively calcified, and the aortic orifice so narrowed that the little finger could be just pushed through.

¹ *Op. cit.*, p. 204.

The *chordæ tendinæ* of the mitral valve had also undergone calcareous degeneration, and portions of the valves likewise. The walls of the left ventricle were somewhat hypertrophied."

Although it is evident that the irregularity of the circulation, observed for so many years before Mr. Lawler's death, was due to this calcareous degeneration, the *extreme* degree of stenosis of the aortic orifice, found at the autopsy, probably existed only a few months. The supposed mitral regurgitant murmur heard during life was ascertained to have been caused by the calcareous particles attached to the *chordæ tendinæ* of this valve, and probably not due to regurgitation. This was considered by the expert, Dr. Comegys, to be a serious error of diagnosis, and the explanation unsatisfactory. "How could mitral regurgitation exist through so many years," he exclaimed, "without causing disturbance of respiration, cough, enlargement of the liver, and general dropsy?" In the first place, it may be observed that mitral regurgitation to a moderate degree has in many cases undoubtedly continued through many years, especially in persons leading a very quiet life, without producing any rational signs of its existence. It seems absurd to quote an authority in regard to a fact so generally known. A very satisfactory explanation of the mitral murmur was found after death in the condition of the *chordæ tendinæ*.¹ It is true Dr. Comegys was dissatisfied with this explanation, but, as he was summoned as an *expert* to discredit my testimony, it is not surprising that he should find me wanting in accuracy. On the same side testified Dr. Carson, who may be truly regarded as an *expert in thoracic diseases*, but he was unable to agree with his colleague, Comegys. As he had testified in regard to the characters of the tracing in atheroma of the arteries, so he candidly, fairly, and intelligently gave his views of the heart-changes and the signs by which they had been represented during life. Dr. Carson stated that a mitral murmur would be caused by the conditions I had named, viz., calcareous concretions on the *chordæ tendinæ* of the mitral; and that a mitral murmur heard with the first sound, when evidences of aortic obstruction existed,

¹To ascertain how ill advised was this criticism of Dr. Comegys, the reader may consult Flint "On the Heart," second edition, p. 186.

would naturally be referred to regurgitation through the auriculo-ventricular orifice. The absence of rational signs of such regurgitation would appear in that event to be dependent on an extremely guarded and careful life, and immunity from all kinds of emotional disturbances—conditions existing in Mr. Lawler's case.

The chief interest in the Lawler-will case necessarily centres in the mental condition of the testator. Soon after my attendance began, I saw that Mr. Lawler was quite unequal to the task of managing his estate, and advised that he be relieved, in an appropriate legal way, of its charge. Of his will, of the codicils, and of any intentions in regard to the disposition of his property, I was wholly ignorant, and remained so until after his death. Therefore, long before the legal contests began over the will, I was committed to an opinion adverse to Mr. Lawler's testamentary capacity.

Whatever opinions in regard to Mr. Lawler's mental soundness may have been entertained by the witnesses to fact, it was agreed by all who had the opportunity of observation that he had experienced a remarkable change as to his ability to read after the severe fall in September, 1867. His singular disability involved also a knowledge of the figures and movements of the game of chess. Decided failure of memory in regard to property, places, and individuals, was presently observed. He could not recall a valuable piece of real estate which he owned within a short distance of his residence. In five minutes after having indorsed it he forgot the intention and value of a bank-check for six thousand dollars, and insisted upon my taking it on the occasion of a professional visit. When informed of the nature and purpose of the check, he fell into great confusion of mind, and could not be made to understand the transaction. Notwithstanding these marked evidences of impairment of mind, he often conversed very well, especially in regard to the persons and events of many years ago. He betrayed, too, at times, remarkable acquaintance with minute affairs. Thus, one day, in my presence, he desired a particular newspaper to be discontinued, and named the sum (ninety-eight cents) due the car-

rier. It happened in this way that casual visitors formed very erroneous notions of his real mental state; for, anticipating the evidences of decided unsoundness of mind, they were surprised that he was able to converse on small topics in his usual manner.

This feebleness of mind was also shown in his entire dependence on his wife during the period which elapsed from "the fall" to the time of her death. When in his normal mental state, Mr. Lawler was self-reliant, impatient of contradiction, and absolutely intolerant of control. After the failure of mind became pronounced, he was submissive, deferred to his wife in all matters, and constantly asserted his entire dependence on her guidance. He, himself, was quite conscious of the decay of his powers. He used frequently to say that he was a mere animal; that he had no mind left to appreciate any thing; and that, should he survive his wife, his condition would be utterly deplorable. His inability to conduct any affairs was painfully exhibited at table, when he attempted to supply his own wants. He spilled the tea or coffee, put butter in his coffee, and salt on his bread, would miss his mouth, and deposit the food in his bosom, and was oblivious of what he ate; so that Mrs. Lawler or a friend found it necessary to feed him.

As might be expected, in the last month of his life his failure of mind became more conspicuous. He had hallucinations and delusions, was unaware of the passage of time, mistook day for night and night for day, etc.

Besides the impairment of mind due to obvious intra-cranial changes, other causes influenced unfavorably Mr. Lawler's mental operations. As I have stated in my original note, "at all times he experienced more or less vertigo, but frequently the attacks were so severe as to incapacitate him from any physical or intellectual exertion. When he rose from the bed, or attempted to exercise his mind deeply on any topic, the vertigo came on, accompanied by nausea. During these attacks his eyes were suffused, his face congested, and the veins of the forehead swollen. The vertigo seemed to me to be due to—1. The irregular supply of blood to the brain in consequence of the obstruction and regurgitation at the aortic

orifice; and, 2. To a structural alteration of some part of the left hemisphere of the brain, as evidenced by the dilatation and immobility of the left pupil."

The following were the changes found on examination of Mr. Lawler's brain :

"The basilar artery, the arteries of the circle of Willis, the middle and anterior cerebrals, were thick, hard, white, and chalky. The basilar artery was of the size of a goose-quill. All of these arteries had varicose dilatations, a condition of things which extended to the smaller arteries of the brain, so far as I examined them. There was a small amount of serum in the arachnoid spaces. The convolutions of the brain were remarkable for their depth and complexity. No alteration could be found in the third convolution of the left side, in the island of Reil or neighboring parts, except the same alterations in the arteries which existed throughout the brain. Section of the hemispheres disclosed no lesions of the central white matter or of the cortical periphery. The right lateral ventricle contained a small amount of clear serum. The left was distended with fluid, its posterior cornu being much enlarged, occupying most of the posterior lobe, which was hollowed out to contain the fluid. A very thin stratum of cerebral matter, consequently, was interposed between the tentorium and this cavity. The serous lining (ependyma) of the enlarged left ventricle was opaque and thickened. Attached to the left choroid plexus, and firmly wedged against it in its ascent to the middle cornu of the ventricle, was a globular calcareous mass, a half inch its transverse diameter. This calcareous mass, by compression of the vessels of the choroid plexus, interrupted the return of blood from this part of the brain, thus causing the effusion above described. As a part of the choroid plexus was dragged down, the anterior portion being kept tense, it is rendered evident that at some previous time the calcareous mass had occupied a different position. The history of the case indicates that the mass was dislodged, and, falling down into the middle cornu, compressed the choroid plexus at the time when Mr. Lawler suffered the severe fall and concussion of the brain, which was followed by amnesia of written language. I do not claim for this opinion any thing more than that it is a plausible conjecture."

The chief contest, so far as the medical opinions in the case were concerned, was in regard to the symptoms and morbid appearances detailed in the above extracts from my original paper. Four experts, Drs. James Graham, William Carson, C. G. Comegys, and John Davis, testified for the defendant of the will. Dr. Graham's testimony touched briefly but clearly on the questions of amnesia, senile dementia, and testamentary capacity, and did not include the controverted questions embraced in the above quotations. Dr. Carson's testimony, which was given on all these questions, was a very creditable exhibition of candor, fairness, knowledge, and sound judgment. Drs. C. G. Comegys and John Davis were excellent specimens of the genus "swift witness," especially the former, who exhibited an ardor in his partisanship, a confidence in his statements, and a lofty exuberance in his illustrative discursions, well calculated to awaken suspicion, in the minds of the jury, of his motives.

The explanation which I had given, of the causes producing vertigo, was attacked by Dr. Comegys, who maintained that suffusion of the eyes, congestion of the face, and swelling of the veins of the forehead, could not be induced by intracranial lesion, because the vascular system of the face has no connection with that of the brain. He did not appear to know that the facial vein communicates with the internal maxillary vein, which receives blood from the middle meningeal veins, and also with the pterygoid plexus, which forms anastomoses with the cavernous sinus. He should not have overlooked, also, the admirable researches of Donders¹ in regard to the circulation in the orbit, and the action of the eyelids in expiratory effort. Nor should he have been unacquainted with the practical fact, noted by systematic writers, that injection and suffusion of the eyes and swelling of the veins of the forehead and face are, *cæteris paribus*, characteristic signs of pressure within the cranial cavity. On this point it will suffice to mention one of the most recent and esteemed German works on practical medicine—Niemeyer²—who considers puffiness

¹ Beale's "Archives of Medicine," vol. v., p. 20, *et seq.*

² "A Text-book of Practical Medicine," vol. ii., American edition, p. 246, *et seq.*

of the face and a varicose condition of the vessels very significant of intra-cranial disease, *especially of the posterior fossa.*

That the vertigo was dependent on disorder of the cerebral circulation, due to stenosis of the aortic orifice, and pressure in the posterior fossa, can hardly admit of dispute. The vertigo was not an hallucination; for, when he lay quietly, without thought or motion, he was free from it; but, when he rose up or attempted any exercise of the mind, he became very dizzy and much nauseated. This condition of the intra-cranial circulation interfered very much with mental operations, and indeed rendered any prolonged or attentive consideration of any subject impossible. Partly due to the same cause, and partly to pressure on the motor ganglia at the base, walking was uncertain, and his gait titubating. During the sixteen months of my attendance, Mr. Lawler was confined the greater part of the time to the bed, and, when dressed in the afternoon, to the sofa. On a few occasions he walked out, but he was usually unequal to any effort of this kind, and his inability to recognize the streets rendered it hazardous.

Besides these interferences with the intra-cranial circulation, causing vertigo, and hence imperfect intellection, Mr. Lawler had lost the faculty of knowledge of written or printed characters. His condition of *amnesia* had existed from the time of the fall already alluded to. All the witnesses who were accustomed to see Mr. Lawler, testified positively to this fact. On my first visit I ascertained definitely that he could see the printed characters, but that they conveyed no information to his mind. Thus the large head-lines of the newspaper—the CINCINNATI GAZETTE—he was unable to read, although he saw them perfectly. He would adjust his spectacles, take up a pen, and write his name, and yet he could not tell, as he repeatedly assured me, whether what he had written was or was not his name. During the trial it appeared in evidence that he had written, some months subsequent to the fall, a very short note, and had made out a bank-check for five thousand dollars. I learned during my attendance, although I saw no instance of it, that “he was in the habit of writing on his slate directions in regard to business transactions, but he was unable subsequently to read the writing,” although legible enough to others. It

appeared further that it was his custom to consult daily the thermometer in the hall, and that he could read the degrees correctly. These facts indicate that his vision was good, that he was able to do certain automatic acts, exhibiting knowledge of written and printed characters, yet it was shown beyond question that he could not read even those words and characters which he himself had written. I held this defect to be *amnesia*, due to intra-cranial disease affecting the left hemisphere, and that the acts apparently exhibiting intelligence were simply *automatic* in character. For these opinions I was severely criticised by the experts. A Dr. John Davis, one of the experts, characterized my views as "absurd." Dr. Comegys found himself entirely unable to conceive of the coexistence of amnesia and an ability to write the characters even to so limited an extent as Mr. Lawler was shown to do. Whatever may be the view taken of this condition, at least this is evident: the visual perception of written or printed characters failed to be converted into ideas. This break in the communications may have resulted from pressure of the fluid in the posterior cornu of the ventricle on the *tubercula quadrigemina*. There may have been no impediment to the issue outwardly of the mental conception in a voluntary act, as of writing. Such an explanation, however, appears to me less intelligible than that I have already given, viz., that he had lost the memory for written or printed characters, but was capable of some very limited automatic acts in connection therewith. It is now well understood that many of those acts which we at first acquire with great labor, by frequent repetition become so easy that they are performed without the intervention of the will, and even without consciousness. A large number of the acts which we daily perform are thus gone through with automatically. Signing one's name may be classed with piano-playing, dressing, winding a watch, and other automatic acts. Modern psychological writers distinctly recognize these acts as automatic, in the sense that they are performed unconsciously or without the direct supervision of the supreme centres. It is true Sir William Hamilton¹ regards the mind as conscious during sleep, and in the somnambulistic state, "and that we are

¹ "Metaphysics," American edition, Lectures xviii. and xix.

never wholly unconscious of its activity." He denies the correctness of Hartley's conclusions regarding our "acquired dexterities." Nevertheless, he removes from the sphere of consciousness these acquired dexterities, and admits that "at last we are only aware of the general state which results from these unconscious operations." Hartley, in his "Observations on Man," shows how many of our mental acts are performed without thinking of them, and these he classes together as "automatic actions of the secondary kind." This view is now admitted by some of the most influential of modern psychologists. Thus Maudsley holds that "when an idea or mental state has been completely organized it is revived without consciousness, and takes its part automatically in our mental operations just as an habitual movement does in our bodily activity."¹ In another place he remarks: "As it is with memory so it is with volition, which is a physiological function of the supreme centres, and which, like memory, becomes more unconscious and automatic the more completely it is organized by repeated practice." Herbert Spencer² also distinctly recognizes that volitional acts may become automatic, in the following language: "The actions we call rational are, by long-continued repetition, rendered automatic or instinctive." He further says: "In short, many if not most of our common daily actions (actions every step of which was originally preceded by a consciousness of consequences, and was therefore rational) have, by perpetual repetition, been rendered more or less automatic. The requisite impressions being made on us, the appropriate movements follow, without memory, reason, or volition, coming into play."

The few acts indicating knowledge of written characters, which Mr. Lawler was shown to have performed, may have been automatic in character, executed without the interposition of the higher centres, and because the lower centres had been so perfectly trained in their performance. Signing his name on one occasion, filling out a check, and writing a very simple note, were the only acts of this kind he was positively

¹ "Body and Mind," p. 26; also "Physiology and Pathology of the Mind."

² "Principles of Psychology," vol. I., pp. 456-458.

known to have performed. It was admitted by all that he could not read his name, or any writing of his own, or any written or printed characters. Forbes Winslow¹ gives the case of "a patient" who "in consequence of an injury to the brain forgot how to *read*, but was still able to *write* fluently and correctly." This is still more remarkable than the case of Mr. Lawler.

As I have already shown, Mr. Lawler was extremely sensitive to temperature changes, and had the habit of consulting his thermometer frequently during the day. It is questionable whether he was able to do more than approximate closely to the actual height of the mercurial column, as he certainly was unable to read the figures.

In my preliminary note I had indicated my belief that the amnesia of written language was dependent on disease of the left hemisphere of the brain. The post-mortem examination having disclosed no lesion of the anterior lobe of the third frontal convolution, or of the walls of the Sylvian fissure, but of the posterior lobe of the left hemisphere, I ventured to suggest that this case, "so far as one case can, demonstrated that the posterior lobe of the brain takes part in the important intellectual operations of speech and of written language." This case conforms to the constantly-increasing number, showing the association of the faculty of language with the left hemisphere. Although we can hardly admit, with Broca, that this faculty has its exclusive seat in the third left frontal convolution, or, with Meynert, that it is located in the walls of the Sylvian fissure, numerous positive facts, the value of which a few unexplained negations do not destroy, show that the left hemisphere only is educated in the function of language. Even so determined an opponent of the localization of faculties as Brown-Séquard admits that the left hemisphere is most intimately concerned in the function of language, and that aphasia with left hemiplegia is an exceedingly uncommon event.

A determined effort was made, by the able counsel of the defendant of the will, to impair the value of my testimony in regard to the post-mortem appearances of Mr. Lawler's brain.

¹ "Obscure Diseases of the Brain and Mind," American edition, p. 251.

For this purpose they put forward Drs. Comegys and Davis. They hoped, by multiplying the differences of the medical experts, to discredit the medical testimony in the case—a plan of procedure in which ingenious lawyers are frequently aided by too zealous, or ignorant, or knavish doctors.

In order to facilitate the description of the lesions, and their relation to surrounding parts, I have taken from Henle's "Hand-book of Systematic Human Anatomy"¹ the subjoined cuts of the lateral ventricles. I need hardly remark that Henle is one of the first of living anatomists.

In Fig. 3, the roof of the lateral ventricles being removed, we have in view the choroid plexus *in situ*. That this body—the choroid plexus—lies loosely attached to the velum interpositum, and is readily stretched, is a fact so perfectly well known that to make a formal statement of it would appear to be a labor of supererogation; but Dr. John Davis, one of the *experts*, testified that it was rigidly adherent, and that to stretch it was not possible! No statement could better illustrate Dr. Davis's capacity as an expert. It will be seen, by reference to the cut (Fig. 4, p. 466), that about one-third of the choroid plexus is contained in the middle cornu of the ventricle.

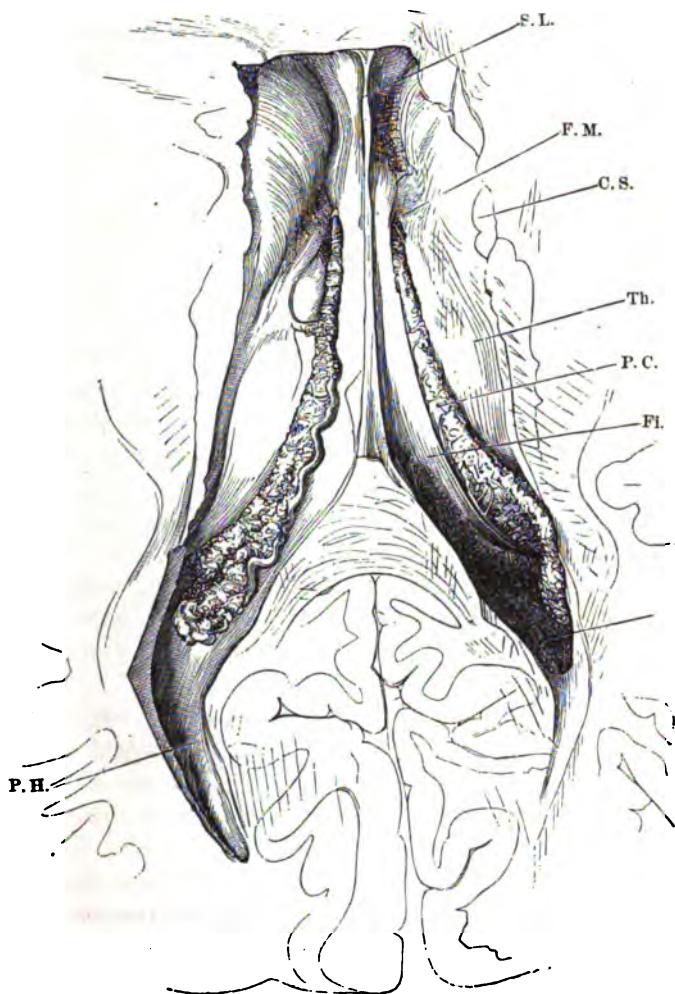
So loose and extensible is the choroid plexus, that a body (for example, a calcified cyst) attached to its middle third might easily put the anterior portion on the stretch, and cause a folding of the posterior portion in the middle cornu. Drs. Comegys and Davis testified that such an accident was an impossibility.

The globular, calcareous mass attached to the left choroid plexus was undoubtedly a calcified cyst. As is well known, the choroid plexus, in consequence of its anatomical structure, is not unfrequently the seat of formation of these cysts. Having formed, the calcification of the cyst was brought about under the same conditions as the calcareous degeneration of the vessels. As it slowly developed, its presence in the ventricle wrought a gradual change in the ependyma and an increase in the serosity. As the fluid increased in the ven-

¹ "Handbuch der systematischen Anatomie des Menschen." Dritter Band. Nervenlehre. Braunschweig, 1871.

tricle, greater motion of the cyst was possible. With the increase of fluid, there should have occurred some subjective and objective symptoms. In fact, these were observed. Mr. Lawler had frequent attacks of vertigo, in one of which he fell from his chair when engaged in playing whist. A more violent fall

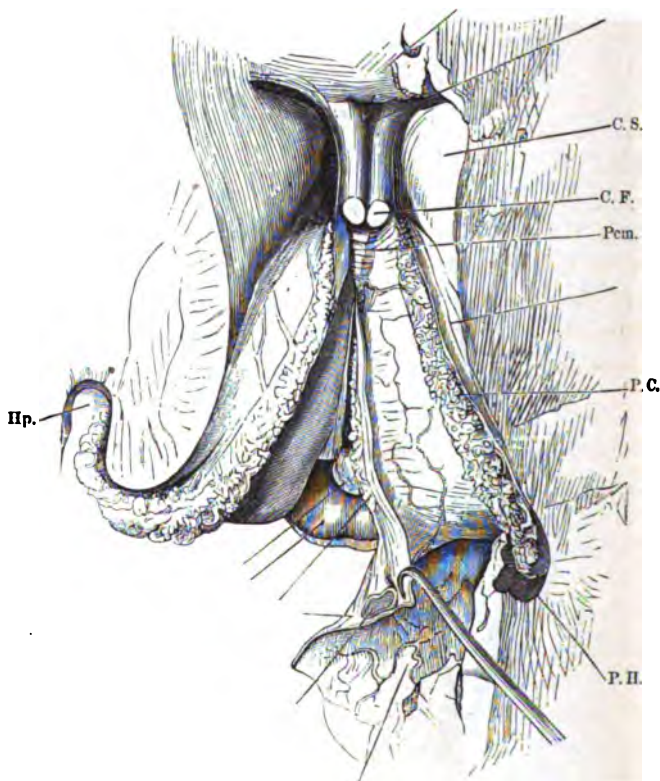
FIG. 8.



S. L., Septum Lucidum; F. M., Foramen of Munro; C. S., Corpus Striatum; Th., Thalamus Opticus; P. C., Choroid Plexus; Fl., Corpus Fimbriatum; P. H., Posterior Cornu.

was followed by amnesia of written language, and by dilatation and permanent immobility of the left pupil. My explanation of the occurrence of these phenomena was this: The calcified cyst was dislodged, by the concussion of the fall, into the middle cornu, where it compressed the choroid plexus, and that the great accumulation of fluid was due to this compression. Drs. Comegys and Davis pronounced this impossible. The former expert went into an elaborate comparison of the

FIG. 4.



(From Henle, p. 331.—The references in this are the same as in Fig. 3.)

ventricles of the brain with certain topographical features of the valley of the Ohio at Cincinnati—in order to show that arrest of the drainage of a low valley would not cause an overflow of a much higher ravine. This was an unfortunate

comparison, for, if an accumulating body of water have no outlet, it must eventually rise above the highest surrounding country.

At the autopsy the calcareous mass attached to the choroid plexus was found wedged in the entrance to the middle cornu, where it necessarily compressed all that part of the choroid vein—about one-half—lying behind. As the mass was irregular in shape, there were interstices permitting the fluid as it accumulated to rise out of the cornu into the general cavity of the ventricle—a fact the possibility of which was energetically denied by Dr. Comegys.

It has long been known that compression of the vein of Galen will be followed by dropsy of the ventricles, and if the foramen of Munro, through which the *plexus choroides* communicate, be closed, and the point of compression be in one ventricle, that only will be the seat of the effusion. The cyst, which in this case was situated in the left ventricle, must, before its lodgment in the middle cornu, have compressed some of the branches of the vein of Galen, causing more or less effusion. This may easily be seen by reference to the subjoined cut taken from Hirschfeld¹ (plate 18):

FIG. 5.



In addition to this compression of the vein of Galen, decided alterations had occurred in the ependyma. Virchow

¹ "Traité et Iconographie de Système Nerveux," etc., second edition, Paris, 1866.

holds that intra-ventricular effusions, not produced by mechanical interferences with the return of blood, are due to alterations of the ependyma. Rirddfleisch, combating this view, maintains that the choroid plexus is more immediately concerned in the formation of these effusions. "In hydrocephalus," he observes, "anomalies in the distribution of blood in the choroid plexus occasion the effusion." He demonstrates the correctness of this opinion by arguments drawn from the nature of the anatomical structure of the plexus, and of the ependyma. The latter does not contain blood-vessels, and, when thickened, especially acts as a barrier against the transmission of fluid from the cerebral vessels beneath.¹

All these considerations, therefore, indicate the correctness of my original declaration, that alterations in the choroid plexus caused the unilateral effusion in the case of Mr. Lawler. Moreover, numerous cases of the same kind have occurred. The experts, Comegys and Davis, it is true, were not aware of the existence of such cases, and hence the conclusions to which they came were founded on very narrow spheres of observation, and hasty and superficial study of the anatomy of the parts involved.

The case of Dean Swift is a notable example of chronic hydrocephalus. It is narrated by Sir Walter Scott that the dean remained in a state of stupor for three years in consequence of water on the brain. In a case of hydrocephalus, occurring in a man fifty years of age, whose history is given by Dr. Baillie (Watson), there occurred right hemiplegia and aphasia, the patient having lost the memory of all but a very few words. Förster² has related a case in which the fifth ventricle only was the seat of the effusion, and Wallman³ one in which the effusion was limited to the *septum lucidum*. Rokitsansky⁴ says that, although hydrocephalus is usually a symmetrical disease, it may be limited to one ventricle.

Virchow,⁵ in discussing the pathogeny of dropsy of the

¹ "A Text-book of Pathological Histology," American edition, p. 680.

² "Virchow's Archiv," 1858.

³ Ibid., xiii., 1858.

⁴ Vol. iii., p. 278, American edition.

⁵ "Die Krankhaften Geschwülste," Erster Band, Berlin, Hirschwald, 1868.

ventricles of the brain, describes a form of "*cystic dropsy of the posterior cornu*." He illustrates the manner in which these local effusions take place by a preparation in which the accumulation was limited to the fourth ventricle, there being paralysis of the facial nerve. In this remarkable case the effusion was due to a cyst of the inferior choroid plexus. Niemeyer,¹ under the title "*hydrocephalus acquisitus*," gives an admirable description of the chronic form of the disease. He mentions the dilatation of the ventricles, and the thickening of the ependyma, and draws a striking picture of the symptomatology of these cases. "Among the encephalic lesions which take the first rank" in the causation of hydrocephalus acquisitus, says Jaccoud,² "are cerebral tumors, meningeal or osseous, which exert compression on the venous canals, especially the vein of Galen."

The numerous cases of an analogous kind which have been reported render it certain that the lesions found in Mr. Lawler's case were by no means unprecedented.

I have yet to notice another point made by one of the experts, Dr. John Davis, who was put on the stand to prove that the changes which were discovered in the brain of Mr. Lawler were only those of senile atrophy. For this purpose he retailed to the jury as much as he could remember of Rokitsansky's description of this state. It is true that a form of hydrocephalus occurs in the aged, which is associated with atrophy of the brain-substance, but pathological changes, such as I have described, distinctly separate the case of Mr. Lawler from the condition of physiological decay normal—so to speak—to advanced life. In this case, the convolutions were stated to be "remarkable for their depth and complexity," and some clear serum was found in the arachnoid spaces, and in the right ventricle—facts which indicate that a theory of senile atrophy was insufficient to explain the morbid appearances.

While engaged in his zealous explanations of senile atrophy, Dr. Davis was involved by counsel in some remarkable errors of statement. He affirmed that the cavity of the skull being

¹ *Op. cit.*, vol. ii., p. 246.

² "*Traité de Pathologie Interne*," tome i., Paris, 1870.

closed, the amount of blood contained in it could not suffer diminution, repeating the views of Abercrombie and Kellie, so given and defended by Bennett. He seemed to be unacquainted with the modern observations on the office of the cerebro-spinal fluid, and the *foramen magnum* in regulating intra-cranial pressure.

I had intended making some observations on the conduct of medical experts and medical witnesses to fact, but the length to which this article has extended forbids. In this trial, as in so many, medical experts were made to perform a part not creditable to their profession. Their opinions were used not to enlighten, but to confuse the jury. The exhibition of personal enmities was encouraged, in order to destroy the value of all the medical evidence.

ART. III.—*Suggestions relative to the Sequestration of Alleged Lunatics.* By R. W. PARSONS, M. D., Superintendent of the New York City Lunatic Asylum.

WITHIN the past few years, the methods of committing patients to asylums for the insane have attracted considerable attention, and have occasioned no little discussion in this country. The people, who are naturally jealous and sensitive on the subject of their personal liberty and rights, have been rendered, perhaps, unduly sensitive in regard to the confinement of sane persons in lunatic asylums, through the influence of certain sensational novels that have gained a wide circulation through the distorted representations of patients who have been discharged when yet uncured, and also from the fact that sane persons sometimes actually are confined as lunatics. Hence it is not surprising that men have attempted to secure the enactment of laws in several of the States, to the effect that no person shall be confined as a lunatic without a jury-trial. In one of the States such a law has been enacted.

On the other hand, medical superintendents of asylums are disposed to favor those methods that are least likely to prove causes of irritation and annoyance to the patient, and that offer as few obstructions as possible to early hospital care and treatment.

It is not surprising that the popular sentiment should be in favor of the greatest possible safeguards against the confinement of sane persons in asylums for the insane. The possibility of such an event is disagreeable in itself, for, if one person may be unjustly confined and branded as a lunatic, why may not another? Who, in fact, can feel assured of his personal liberty? But the loss of personal liberty may not be the most serious consequence involved; for the mistake may soon be discovered and liberty regained. In the mean time, however, the property of the alleged lunatic may be badly managed, squandered, or appropriated by incompetent or dishonest relatives; or his children may make unfortunate alliances or associations; or they may so lose in respect for their parent as to be thereafter beyond his influence. While confined within the walls of an asylum, physical injuries may be received from some of the irresponsible persons with whom he is associated; or his mind may be unfavorably affected through chagrin, wounded pride, a sense of injustice, or through local associations and disturbing influences. If there be a predisposition to insanity, these causes may be sufficient to induce an attack of the disease. Conditions that are favorable to persons who are insane, may be unfavorable to those who are not. When the alleged lunatic has been discharged as *not insane*, his disabilities and annoyances are by no means at an end. It will be found that many persons still entertain feelings of distrust toward those upon whom a suspicion of insanity has rested, even though this suspicion has been declared unfounded by competent authority. On account of this distrust, his business prospects are likely to be less favorable and his social relations less pleasant than before. Dread of recommitment to an asylum may prove a still further and not unfounded source of annoyance, for it unfortunately happens that the simple fact of a previous commitment is often considered a strong argument in favor of the propriety of a recommitment.

Arguments like the above are urged in favor of what are supposed to be the strong safeguards of a jury-trial.

Alienists are, without exception, opposed to the method of trial by jury, for reasons like the following :

A jury of six or any other number of unprofessional men is utterly incompetent to decide regarding the sanity or insanity of a doubtful case; and it is only on account of those that are not evidently and unmistakably insane, that a jury-trial is proposed. Even with the aid of skilled specialists in insanity, the jurymen cannot be expected, within the period of a few days, to learn and thoroughly understand principles, and to appreciate the significance of manifestations, that have required the careful study of men equal to themselves in intelligence, for long periods of time and under the most favorable circumstances. The opportunities afforded in a court-room for the direct study of a doubtful case of lunacy are exceedingly unfavorable; for many persons who are really insane are able to conceal their delusions, and to conduct themselves in a becoming manner, while undergoing a public examination that they are aware is to decide the question regarding their sanity. Hence, if the jurymen make a rational decision, they must adopt the opinions of the medical experts; or, in other words, the medical experts virtually decide the case. If the experts disagree, it is hardly to be expected that the jury will elicit truth from the resulting uncertainty and confusion.

The probability that a jury-trial will be entirely barren of good results is not the chief objection, however, to this method of ascertaining the mental status of alleged lunatics, and of securing their admission to asylums for care and treatment. The chief objection is, that a jury-trial is likely to injure the patient.

The insane are often so debilitated by physical disease before the necessity of sending them to an asylum is fully realized, that dispatch and an avoidance of all disturbing influences are of the utmost importance. The delay of a single day may jeopardize the life of the patient. Starvation is often imminent through want of knowledge on the part of friends of the real condition of the patient, or through lack of tact or skill in administering the necessary food. The mental excitement is often such that the patient needs to be kept in the greatest possible quietude and seclusion. The publicity of a court-room would tend greatly to increase such a state of excitability, and would perhaps destroy the chances of a cure.

Again, many sensitive patients would be as much annoyed by having the question of their sanity submitted to a jury for a decision as they would as if they should be arraigned before a court of justice on a criminal charge. After recovery had taken place their objections to such a course of procedure would be in nowise diminished; for then they would fully realize that calamities and weaknesses, which should have been respected and concealed, have been unnecessarily and unjustifiably paraded before a curious and unsympathizing public.

The objections just mentioned would also be understood and appreciated by the relatives and friends of the insane; and hence, in order to avoid the publicity and the dangers inseparable from a jury trial, the advantages of asylum-treatment would not be secured until the latest possible moment. The most favorable opportunity for efficient treatment would thus oftentimes be lost, for it is a well-established fact that a very large percentage of the patients who are admitted to asylums soon after the commencement of the disease are cured, while the prognosis in the case of those who are kept at home for a considerable period of time is decidedly unfavorable.

The three great objections, then, to the method of committing insane patients to asylums through the medium of a jury-trial are these: 1. That the method is inefficient; 2. That the patients are very liable to be injured directly by the delays and excitements inseparable from the process; and—3. That they are liable to be injured indirectly by being kept at home, on account of the prejudice of their friends against a jury-trial.

Some medical superintendents of asylums for the insane are strongly of the opinion that there should be no greater difficulties in the way of placing an insane patient in a lunatic asylum than of placing a case of fever in an ordinary hospital. They hold that, if it is proper to confine a delirious person to his room or bed without a legal process, it is quite as proper and sensible to confine a person whose mental incapacity is similar in character, but only a little more chronic in form, in an asylum without a legal process. The patient is sick; he needs treatment. He is incapacitated from judging of what is best for himself; his friends should be allowed to

judge for him. Thus the proper steps would be taken at the proper time by those most interested in the welfare of the deranged person; while all publicity, excitements, and annoyances of every kind, would be avoided. Especial provision might easily be made to prevent the confinement of sane persons in asylums by a regular and systematic inspection of all such institutions by competent and legally-constituted authorities.

Here we have the extreme views of men who look at the same subject from different stand-points. The one party, having especial regard to the interests of those who are not insane, desire to so hedge about the entrance to our asylums as to render the admission of an improper subject an impossibility. The other party, looking rather to the best interests of the insane, desire to have all obstructions removed that will have a tendency to hinder their early and facile admission.

Neither of these views has gained the public confidence to any great extent. Both are open to very serious objections. Hence in this and in some of the other States a middle course has been adopted by which the most serious of these objections have been avoided. The law of the State of New York, as applied to New York City, provides substantially as follows: Two respectable physicians are first to examine the alleged lunatic. If satisfied that the person is insane, and needs asylum care and treatment, they make a joint affidavit to that effect before a *judgé* (magistrate). Hereupon the magistrate (judge) commits the patient to an asylum in due legal form, retaining the affidavits of the physicians as his vouchers. A method similar to the above in all its essential particulars has recently been recommended for general adoption by the Association of Superintendents of American Asylums for the Insane.

By this method all the advantages of the other two are gained, and all the disadvantages avoided. Due provision is made for securing dispatch, medical testimony, and legal process, on the one hand; and for the avoidance of publicity, unnecessary delays, and excitements, on the other. Theoretically this would seem to be all that could be desired. Practically, however, there are some important defects which it is believed admit of an easy remedy.

Since the year 1847 no less than one hundred and twenty-five persons, who have been committed to the New York City Lunatic Asylum as insane, have been discharged as improper subjects. During a single year forty persons have been discharged from American asylums as having been *not insane* at the time of their admission. Many such cases are admitted every year.

It would appear, then, that there must still be some defects in the methods by which patients are placed in asylums, or else that there is a failure in complying with the legal requirements. If there be any such defects or failures, it is of the utmost importance that they be remedied. A thorough reconsideration of the whole subject, then, would seem to be demanded, as thus alone can all the conditions be understood, and more perfect methods adopted.

The first subject of inquiry should evidently be regarding the nature of the cases that are improperly committed to asylums for the insane. Among these may be enumerated those laboring under the delirium of fever under the immediate effects of alcoholic intoxication, cases of acute cerebral inflammation or congestion, of simple debility, of eccentricity, of imbecility, of the childishness and weakness of mind incident to old age, cases of feigned insanity; and, finally, those regarding which mistakes have been made through lack of a sufficient knowledge of mental manifestations in the sane and in the insane, through want of care and thoroughness in making the diagnosis, through too great reliance on the statements of others, and through faulty methods of investigation. To these may be added certain cases of transient mania which have made a perfect recovery at the date of their admission, although they may have presented undoubted indications of insanity when the diagnosis was made.

For the avoidance of many of these mistakes the exercise of care and of ordinary acumen and medical knowledge would suffice. If a case of typhus fever, of drunkenness, of narcotic poisoning, of acute cerebral inflammation, or of simple physical exhaustion, complicated it may be with a lack of knowledge of the English language, be diagnosed as a case of insanity, the mistake should be considered simply as a medical blunder;

one of those blunders, however, that may prove more detrimental both to physician and patient than lack of ability would prove in a case involved in real difficulty. The plea that the patient was at the time of examination quite incapable of exercising his mental faculties would be considered insufficient, for the physical symptoms, if carefully observed, would have sufficed to indicate the true nature of the disease.

In regard to those cases, however, in which the manifestations of disease are principally mental, physicians, as they have hitherto been educated in their profession, are not without excuse if they sometimes make mistakes. They have not been taught the symptoms of mental disease, they have seen few cases of insanity, they have not learned those methods of investigation that are most likely to elicit the facts. Hence they are distrustful of their own knowledge and abilities, and are liable to content themselves with vague generalizations that are principally based on the statements of interested parties, on preconceived notions, and on the appearance of the patient. The appearance of the eye alone has been adduced as the pathognomic symptom on which the diagnosis of insanity was based.

The circumstances may, for instance, be somewhat as follows: The family physician is requested to unite with some other physician, whom he shall choose, to procure the commitment of a supposed lunatic to an asylum. The physician is positively assured that the person in question is very crazy and very troublesome; that his natural disposition has entirely changed, so that he is now ill-natured and exacting, whereas he was formerly amiable and obliging; that, without any sufficient cause, he exhibits outbursts of passion, during which he loses all self-control, and is considered dangerous; that he entertains unfounded antipathies against his best friends; and that his memory is notably impaired. The physician calls on his patient, and is coldly received. He may find him irritable or even much excited. After in some degree enlisting his patient's confidence, he is entertained with a story of wrongs, neglects, and insults. He sees clearly that his patient is not his former self. The change in disposition he interprets as an evidence of an impairment of the affective

faculties; the story of wrongs and insults as evidences of insane delusion. He informs his colleague of the facts he has elicited, and of the opinion he has formed. The associate physician has little personal interest in the case; he is quite satisfied that the family physician is correct in his views; and he is willing to abide by his conclusions. He looks in and sees the patient, however, because the law so requires. The necessary affidavits are then made.

But the coldness and irritability exhibited in the physician's presence may have been induced by dishonest friends; the statement regarding wrongs and insults may have been truthful. The case may have been simply one in which the mental faculties had become somewhat impaired, through advancing years and physical infirmities.

The following histories will serve to illustrate certain classes of cases that have been improperly placed in the New York City Lunatic Asylum as insane:

CASE I.—G. M., a married gentleman, about thirty years of age, manifested no symptoms of mental aberration on his admission, nor yet during his residence at the asylum. He conducted well, was rational in conversation, and came to the asylum of his own free will, although in accordance with the advice of his friends. The history of his case, as given by himself and his friends, was as follows: About six months previous to the date of his admission he had been induced to try his fortune at the faro-table. For a few evenings he was tolerably successful, when he became more confident, and risked a considerable amount of money, which he lost. He tried his fortune again and again, but almost invariably lost all the money he brought to the table. He now made some inquiries, and learned that he had been playing against an unfair game. Much annoyed at the idea of having been swindled in this manner, he resolved to study the theory and the tricks of the game, recover the money he had lost, and then stop gambling. He soon became so fascinated with the excitements of the faro-table, and so strongly impelled by the desire for revenge that he found himself practically unable to pass by a gambling-saloon without again trying his fortune. In fact, he had acquired the *habit* of gambling; but his mental condition

was in no way different from that of multitudes of amateur gamblers who squander their means, beggar their families, and even then sometimes continue their vicious practice by acting as aids and decoys in the service of the professional gamblers who have robbed them of their money. These men are the slaves of a habit that has ruined their morals and weakened their self-control; but this does not constitute the disease we call insanity. In accordance with these views, Mr. M. was discharged as an improper subject, since neither our own observations, nor the statements of his friends, furnished any evidence of insanity other than that he had a strong inclination to gamble at faro whenever the opportunity offered.

CASE II.—W. S. came to the asylum in handcuffs. He was not communicative, but was quiet in demeanor and connected in his answers. He said that he had been staying in the city for the month previous, and that, during that period, he had spent his time in playing cards and in drinking. He strongly averred that he was not then, and never had been, insane, although he had had many misfortunes. His manner, conversation, and appearance, were quite in accordance with his claim. No delusions nor other manifestations of insanity were discovered at the time of his admission, nor yet during a residence of more than two months at the asylum. Before he was discharged he told us that he had been robbed of his watch and of a considerable sum of money just before he was sent to the asylum; that he had been drinking pretty hard, and that his landlord had induced him to give him his watch for safe-keeping; that he (the landlord) had taken seven or eight hundred dollars from between the mattresses of his (patient's) bed, where it had been placed for concealment, saying that his money would be stolen if kept there, and that he would take care of it for him; but that, when subsequently he asked his landlord for his watch and money, the landlord denied having any knowledge of them, and secured his (patient's) arrest; that he was indignant on account of this injustice, and, being somewhat under the influence of liquor, resisted the arrest, when he was handcuffed and soon after sent to the asylum as insane. After his discharge he sued his landlord for the watch and money of which he claimed that he had been

deprived. The testimony of Mr. S. was clear, connected, and circumstantial, and was so far corroborated by other evidence that the jury were satisfied he had been robbed. They returned a verdict for the plaintiff. There can hardly be a doubt that, at the time of his arrest, and of his examination by the physicians, he was in a very excited state of mind. He was under the influence of liquor, and believed that he had been robbed and sent to prison by those who had robbed him. He undoubtedly appeared somewhat like a maniac at that particular time, although a little delay and a little more care would probably have sufficed to demonstrate his true condition. Not only was our diagnosis that he was not insane when received at the asylum corroborated, but the history of the case, subsequently obtained, failed to show that he had suffered from alcoholic mania, or from delirium tremens even, at any time.

CASE III.—J. D., a man about thirty-two years of age, had well-marked symptoms of typhoid fever when admitted to the asylum as insane. He was much prostrated, both mentally and physically. He was received late in the evening. On the next morning he was transferred to the Fever Hospital, where he died on the fourth day after.

S. S., a German, about twenty-five years of age, was received at the asylum, unaccompanied by friends or by any history of his previous condition, or of the causes that led to his arrest. At first he was taciturn, and appeared to be either melancholic or demented. Whenever he attempted to speak it was noticed that his articulation was very defective, like that of an imbecile, and also that he appeared to be dull of apprehension. It was found, however, that our patient was quite deaf. He could understand spoken words only when they were articulated with great distinctness, and near his ear. When carefully questioned, so that he could understand, he gave a connected and apparently reliable account of himself, which was as follows: He said that he was a tailor by trade, had no relatives in this country, spoke the German language only, and that imperfectly on account of his defective hearing, which was of long standing, and that he was arrested without any reason whatever that he knew of, while he was quietly walking in

the street. He had been accosted by a policeman, but did not understand what he said or what he wanted. He was immediately arrested, sent from place to place, and finally to the asylum. His apparent dementia then seemed without doubt to be owing to his imperfect hearing and enunciation, and his apparent melancholia to the chagrin and apprehension caused by his arrest and detention. He was kept under observation for several weeks, during which time he conducted and worked well, and manifested no symptoms of mental aberration. An acquaintance finally called, who fully corroborated the patient's account of himself. He said that he had known Mr. S., who boarded in his immediate neighborhood, for a considerable period of time; that he was always quiet and industrious, and that he appeared to be then, in all respects, in his normal state of mind. None of his neighbors had ever thought of Mr. S. as insane.

CASE IV.—C. H. was first admitted to the asylum as a patient in June, 1867. He was very incoherent, and was excitable in manner, although he was generally good-natured and inoffensive. He gradually improved, so that in October he was allowed to leave the asylum on trial in the care of one of his friends. Three days afterwards he was brought back in a state of great excitement. He had evidently been indulging in intoxicating drinks. This he afterward confessed, but excused himself by saying that his friend had got him drunk in order to get his money. He again improved to a certain extent, but remained somewhat excitable and incoherent until two or three months previous to his discharge. At about this time he received a severe blow on the abdomen from a patient, the effects of which confined him to his bed for several weeks. He then rapidly improved in mental condition, and was discharged as recovered in February, 1870. Oftentimes, when at the asylum, he asserted that he had several hundred dollars laid by in a savings-bank. On one occasion while he was at the asylum, and still incoherent, an order on the bank for the money was brought for him to sign. The order was an old one that he had already signed; but the signature was indistinct, and an apparently respectable gentleman who brought the paper asserted that the signature desired was a mere mat-

ter of form, as the other signature had been properly made when the patient was in his right mind ; that he simply wished to have the signature made legible in order to save the trouble of proving the fact, and of identifying the original signature. As this story was credited, the affair was not thought of sufficient importance to bring to the notice of the resident physician, and the patient was allowed to re-sign the order. Soon after his discharge, Mr. H. returned, and said that he had been robbed of all of his money. He asserted that he had no recollection of ever having signed an order for the money at all ; and also that he did not owe the money to the man who drew it from the bank. One month after his discharge, Mr. H. was again committed to the asylum as insane. No symptoms of insanity, however, were observed at the time of his admission. After keeping him under observation for two weeks, he was discharged as an improper subject. He asserted that he had demanded the restitution of his money, but that, instead of receiving it, he had been arrested and recommitted to the asylum. He subsequently called at the asylum on several occasions, at considerable intervals of time, and appeared always to be of sound mind. He asserted that he did not taste of intoxicating liquor during the interval between his discharge and his recommitment ; and there is no evidence that he had done so.

CASE V.—D. P., a German woman, thirty years of age, was brought to the asylum without attendance or any statement of the history of her case. She conducted herself properly, and gave a coherent account of her domestic relations, which, according to her story, were not altogether harmonious. In fact, she asserted that her husband had abused her on account of some other woman of whom he was enamoured. Subsequently her husband called and stated that his wife had entertained the idea that a child they had lost some years before had been disinterred and cut in pieces ; that she thought he spent his money with bad women ; that she thought the people wherever she was, would injure or kill her ; and that she was inclined to quarrel with her husband, although she had never been violent toward him. These assertions of the husband, with the exception of the one regarding her belief in his inconstancy, were not corroborated by a further examination of the patient,

who, during the three weeks of her residence at the asylum, conversed and conducted herself in a rational and exemplary manner.

CASE VI.—A. C., a Swiss woman, about forty years of age, was arrested in the street by a policeman, and was sent to the asylum as insane. Her history was as follows: She had formerly been in affluent circumstances, but had become impoverished. She came to the city, hired a small room, and supported herself and her two children by needlework, with the aid of a small income from a piece of property that still remained in her possession. Two weeks previous to her arrest, she had been turned out of her rooms because she could not pay her rent. She was almost a stranger in this city, did not know whither to go or what to do, and wandered about the streets with her two children until she became almost exhausted. When received at the asylum, she was filthy and ragged. On account of her exhausted condition, and her imperfect knowledge of the English language, she may have appeared to be incoherent to the examining physicians. She manifested no real incoherence, however, delusion, nor other evidence of insanity, after her admission to the asylum.

CASE VII.—A. G. appeared to be perfectly rational when admitted—was said to have been “very wild” when at the city prison. This he explained by saying that he was indignant at his unjust detention, and could not speak the English language well enough to make himself understood, so that he might have appeared, and might have been, excited. He stated that he had been in seven prisons within a few days. This seemed to be an extraordinary statement; but, on a little further inquiry, it appeared that he referred to the different police-stations and court-houses in which he had been held in durance after his arrest. He gave a very connected account of his whereabouts after his arrest, and in enumerating the places he saw fit to designate as prisons they really amounted to the number stated. He also said that the Jews were inimical to him, and persecuted him. Without further inquiry, it might be inferred that he entertained unfounded suspicions against the Jews that would rank as insane delusions. What he really meant, however, was that certain Jews in his immediate neighborhood who were engaged in the same business with himself

thought that he conducted his business affairs in such a way as to damage their own; that they had quarrelled with him, and threatened him on that account; and, as he believed, had caused his arrest. Now, even if he were quite mistaken in the supposition that these Jews caused him to be arrested, this mistake could not under the circumstances be considered as a proof of insanity. Mr. G. was under observation three weeks, and during that time exhibited no evidences of mental aberration either in language or in manner; nor, after an interval of eighteen months, has it been found necessary to recommit him to the asylum.

CASE VIII.—Miss S. J. talked rationally and intelligently, and manifested no symptom of mental aberration at the date of her admission. She stated that at times she did not sleep well at night, but that she never suffered from deprivation of sleep, as she made up by day what she lost at night. She was about thirty years of age. For the ten years previous her health had been poor. She had suffered much from internal hæmorrhoids and from uterine disease, for which she had been a long time under treatment, but had experienced only very temporary relief. Her catamenia were sometimes absent, and at other times diminished. She had an almost constant leucorrhœal discharge, and suffered from a *fistula in ano*. The above points she herself stated at the time of her admission.

At a subsequent period a relative gave the following history of her case, as understood by her friends. It will be noticed that this account, in so far as it relates to her physical condition, corresponds very closely with that given by the patient herself: Miss J. has suffered from uterine disease since her first catamenial period, at which time the menstrual flow was checked by exposure to cold. She usually suffers from dysmenorrhœa, which is severe. Sometimes the catamenia are absent for several months in succession. She has leucorrhœa the greater portion of the time, and also suffers from internal hæmorrhoids, which sometimes bleed. On account of these maladies, she has been under the almost constant care of her physician for many years past. About two years ago it was first noticed that there was a marked change in her feelings and conduct toward men. She began to intrude her-

self into their society, would frequent rooms and places where she was most likely to meet them, and would station herself by staircases where they were most likely to pass. They occupied all her thoughts, and were a constant theme of conversation. If some slight attentions were shown her, they were interpreted as serious in their character, and she would inform her friends that she was engaged to be married on a certain day not far in the future. Before the appointed time had arrived, however, she would either seem to forget her supposed engagement, or she would say that the time for the ceremony was changed to a more distant day; or some new engagement would take the place of the old one. These supposed engagements were very numerous, amounting to fifteen or twenty within the period of two years. In some of these cases she had received only the most ordinary attentions from persons who are positively known to have given her no encouragement whatever. One of them, she was well aware, was at the time under an engagement of marriage to another woman. She has had unreasonable antipathies against her relatives, including small children against whom she could have had no cause of ill feeling. She also entertained groundless antipathies against some of her former associates, making slanderous assertions against their character. Her notions of her own importance and abilities have of late become much exaggerated. Within the past two months she has associated and lived with young women who are known to be of bad repute. Patient's father had been of intemperate habits for some years previous to her birth. A half-brother has suffered several attacks of mania. The statements of the friends are given *in extenso*, as they embrace all the supposed manifestations of insanity that were adduced.

It will be observed that in regard to her physical condition her own statement and that of her friends were quite at accord. Miss J. asserted that in some respects her relatives quite misunderstood her, and that in others their statements were exaggerated, and their account of her actions not in strict accordance with fact. A friend who was well acquainted with her called at the asylum, and stated that, although he had seen her from time to time, he had observed none of the ex-

travagant actions mentioned by her relatives, but that, on the contrary, he had never discovered any great change in her manner, characteristics, or subjects of conversation. Miss J. further stated that her half-sister, with whom she lived, had treated her kindly until the past two or three years, within which time certain differences had arisen between them on account of property, and on account of the too strict supervision which she thought her sister exercised over her. It would appear that her relatives had never considered her as insane until they were told by her attending physician, six months before her admission, that she was and had been for a considerable period of time insane, and that the form of her insanity was nymphomania.

Miss J. was kept under observation for the period of three months, and during that time manifested none of the symptoms of nymphomania, or of any other form of insanity. The conclusion arrived at regarding her case was as follows; viz.: That long-continued and often repeated local treatment for uterine disease had served somewhat to diminish her natural maidenly timidity and reserve; that, after passing the age of thirty years, and finding herself still unmarried, and under a guardianship that she did not always find agreeable, she had become particularly anxious lest she should always remain a spinster, and had resolved to throw herself upon the matrimonial market, with less regard for appearances than was quite in accordance with the more conservative views of her elder sister; that there was a real change in her manners and habits, but that she herself fully appreciated what the change was, and always retained her normal power of self-control; that, in consequence of this change in her manners and habits, misunderstandings, altercations, and ill-feeling, had arisen between her and her relatives; and that, as a consequence of this ill-feeling, prejudiced and untruthful interpretations were placed on her actions and motives. There seemed to be no good reason for supposing that her friends were actuated by any but the most praiseworthy motives when they finally decided upon sending her to an asylum for the insane, but there did seem good reason for believing that they had been greatly mistaken regarding her mental condition. After her discharge

she visited at the asylum from time to time, but was not observed to manifest any symptoms of mental aberration. One of her old friends, with whose family she lived for some time after her discharge, and who has often seen her since, states that he has never at any time had any reason to believe that she was insane.

CASE IX.—Miss Montez, when admitted to the New York City Lunatic Asylum as a patient, was about twenty years of age. She was in good physical health, and was above rather than below the average standard of intellectual capacity. Her command of language was good, and she had evidently received fair educational advantages, and been accustomed to the society of people of considerable culture.

She claimed that she was a daughter of the late Lola Montez and the late King of Bavaria, a princess by birth, and a physician by education. She styled herself the Princess Editha Loleta Montez.

Her own statement of the history of her past life was something extraordinary. She claimed that she was born in Florence, Italy, in 1849, where she lived until she was two years of age, when her mother brought her to America; that she remained in America about one year and a half, when she returned to Florence and remained there until she reached the age of seven years; that she then went to live with her maternal grandmother in Ireland, and remained under her care until she was fifteen years of age, attending school in the mean time and travelling in England, Ireland, and Wales; that she then travelled on the Continent two years, in care of an instructor, after which she returned to Ireland, and stayed with her grandmother until she was nineteen years of age, studying medicine a portion of the time; that she then made another short tour on the Continent, visited Bavaria, started for America in company with the Baroness von Herclotz, and arrived in New York eight months previous to the date of her admission to the asylum; that on arriving in New York she immediately went to Baltimore, where she stayed two weeks as the guest of Mr. Patterson, returning to New York at the end of this time, where she took rooms at the Astor House, became acquainted with Claffin, Woodhull & Co., delivered a

lecture at Steinway Hall, and, to pass over many other adventures, entered a homœopathic hospital as a patient, whence, after suffering various indignities, such as insulting language and the confinement of her person, she was sent to the asylum.

She also stated, in relation to her pecuniary affairs, as follows, viz.: that on arriving in the city of New York she had in her immediate possession about \$500; that, subsequently to her arrival, \$34,000 in cash was sent to her from Europe, and placed in the care of Claflin, Woodhull & Co., bankers; that, after she had drawn \$8,000 of this money from the bank, the firm refused to honor her checks; that she commenced an action to recover the balance, giving the law-firm of Howe & Hummel \$3,300 as a retaining fee, for which amount she had their receipt; that Messrs. Howe & Hummel swindled her out of the retaining fee, and refused or neglected to push her cause further than the initiatory proceedings in court; that Claflin & Woodhull still had possession of jewelry of considerable value which she had deposited with them, but which they refused to surrender; that she had sent a brooch worth about \$3,000, and a diamond valued at \$17,000, to Munich, in the care of the Baroness von Herclotz, on her return to Europe; that she had expended nearly the whole of the \$8,500 she had had in her immediate possession since arriving in this country; and that, as her remaining funds and her jewelry were now unjustly withheld from her, she had found it necessary to go to the homœopathic hospital aforesaid for care and treatment on account of a temporary indisposition.

The above is a mere abstract of her account of herself, as elicited at the time of her admission. She conversed freely and fluently; appeared to have a very fair knowledge of persons, places, and dates, when not too closely questioned in regard to particulars; told a plausible and tolerably well-connected story; and was affable and courteous in her manner, although she evidently made an attempt to support her *role* as princess by her bearing, her language, and her demands. While telling her story she had the appearance of one who is taking especial care to guard against self-contradiction, and her demeanor was such as to excite a suspicion that she was merely playing a part. Certain discrepancies and contradictions in her

statements were noticed, that served still more to strengthen this suspicion. The existence of insanity in her case was, in fact, considered to be highly problematical. Hence she was immediately placed under close observation, in order that it might be determined at an early day whether she was really insane or not.

During the first two weeks of her residence at the asylum no new developments were made. She was lady-like in her deportment, and connected and rational in her conversation, unless her statements regarding her past history should prove to be insane delusions. At the end of this time, however, it was reported that she had a sort of fit, or syncope, while attending church at the almshouse, about a quarter of a mile distant from the asylum. It was said that she was unconscious for several minutes; that there was a tonic spasm of one arm; and that a frothy saliva, tinged with blood, flowed from her mouth. At about nine o'clock the next evening she had a similar fit. The physicians of the asylum were in immediate attendance, and found the patient lying in bed, in apparently an unconscious condition; with her eyes open, fixed and staring; and with a small stream of saliva, tinged with blood, flowing from her mouth. There was no convulsion and no stertor. Her face was rather dusky in appearance, and her extremities were cold. Her arm when raised fell to her side as though she were profoundly under the influence of anæsthetics. When the conjunctivæ were irritated, reflex action was manifested, although apparently under some degree of voluntary resistance. In a moment, however, she became fully conscious, appearing as though she had just recovered from a deep sleep, or from the influence of anæsthetics. Her catamenia had appeared four days previously, but were in every way normal, while her general health had continued unimpaired. On the next evening, while attending the dancing *soirée*, another fit occurred, resembling the preceding. She did not fall to the floor, but leaned against the next patient to her, in a posture that seemed to be studied. She was under the observation of the physicians from the first of the attack. The earliest symptoms noticed were a duskiness of the countenance, and almost an entire suspension of the respiratory movements,

although there was no convulsion, and no stertor or other indication of labored or obstructed respiration. No effort was made to restore consciousness. She was simply watched; the dancing going on in the mean time as though nothing had happened. After about ten minutes she appeared partially to recover, and was led to the door. She then had another attack, and was carried to her room. She was given to understand that severe remedies would be applied in case of a recurrence of her fits. No more occurred during her residence at the asylum. As may be inferred, it was judged that her fits were feigned, or at least voluntarily induced. When questioned regarding her fits, she stated that these were the first that had ever occurred.

Testimony was now sought in regard to her history previous to her admission to the asylum. It was soon ascertained that she had been in New York City for at least several months longer than the period she stated; that she had had fits, similar to those above mentioned, at the house of a clergyman, at the Astor House, at the office of Clafin & Woodhull, and at the Homœopathic Hospital; that she had represented herself as an escaped superior of a convent of nuns; that while a guest at the Belvidere House she took to her bed, at the expiration of the week for which her board had been guaranteed, claiming that she was sick; also that she was an escaped nun, and was pursued, and that she had seen a priest in her room lying in wait for her; also that, while at the Belvidere House, she arose from her bed and left the house in her night-clothes, saying, after she was arrested, that she was trying to escape from the priests who were pursuing her. Certain bills incurred at the Belvidere House would seem to indicate that brandy and wine may have had some influence on her mental condition at that time. One or two physicians who saw her at the Belvidere House thought she was insane. Other physicians who saw her during an apparent attack of illness, and also when in her *fits*, thought she was merely shamming. It was reported that, while at the Homœopathic Hospital, Miss Montez conducted herself in a very violent and outrageous manner; that she required to be placed under physical restraint to prevent her from destroying hospital property, and that she actu-

ally did destroy furniture and other property of considerable value. A witness, who was an *interne* of the hospital at the time, and who had abundant opportunities of observing whatever transpired, stated that she was insulted and abused, and that she merely did what any high-spirited woman might have done in a passion of anger under similar circumstances. The statements of the hospital *interne* and of Miss Montez, regarding her experience and conduct while there, agreed in all essential particulars. From these statements it would appear that, in supporting her character as princess, Miss Montez had been imperious and exacting in her demands, that her pretensions had been ignored and ridiculed, and that a quarrel and a scene had ensued as natural consequences.

From the observations made, and the evidence thus far obtained, the decision could not have been otherwise than that Miss Montez was *not insane*. She evidently was neither melancholic nor demented. Nor yet was her case one of general mania; for the only symptoms of mania that could be adduced were her exaggerated notions regarding her wealth and her past sphere in life, supposing these notions to have really been insane delusions. From what has already been said regarding her deportment at the Homœopathic Hospital, it is evident that her conduct there was not characteristic of general mania. Her conduct was sufficiently accounted for by the circumstances of the quarrel. Similar quarrels and very improper and even violent conduct are often observed in persons who are not insane. Her violence and excitability were manifested only in connection with this quarrel. At no other time, either while at the hospital, before her admission, or after her discharge, did she manifest similar symptoms. Even if the conduct referred to should be considered as arising from the existence of an insane delusion regarding her parentage, this would afford no sufficient evidence of the existence of general mania. Nor yet could this conduct be considered as an evidence of the existence of a state of *hysterical mania*; for there was too much method, too high a degree of self-control, too much persistent wilfulness, to accord with this idea. Still less were the symptoms manifested there of *epileptic mania*, supposing her fits to have been epileptic in character,

which, in fact, was not true. If she was insane at all, the case was clearly what is usually termed *partial mania*, or *partial ideational insanity*. But in partial mania the delusions are fixed and uniform in their character, and they are recognized and acknowledged by the patient as having been first entertained subsequently to a well-remembered date or event, however strong the belief may be in the actual existence of the supposed facts before such date or event. The hypothetical delusions of Miss Montez were neither fixed nor uniform in their character. At the date of her admission to the asylum, she stated her belief to be that she was a princess and a physician; and her account of herself covered the whole period of her past life, leaving no space in time for, and making no mention of, her rôle as nun. A few months before her admission to the asylum she had claimed that she was an escaped superior of a convent, and was pursued by priests. At that time she conducted herself in such a manner as to lead a respectable physician strongly to suspect that she must be insane, and the evidences were quite as strong that she was insane at the one date as at the other. There was not only a change in the supposed delusions, but a wide difference in their character. In the character of princess she was hopeful and exacting; in the character of a pursued nun she was fearful and depressed. Again: at the time of her admission to the asylum she stated that since early childhood she had always known herself to be a princess; that there was no well-remembered date or event previous to which she was not aware of her royal descent.

Her general appearance, bearing, and manner, were at times, perhaps, such as at first to justify a suspicion that she might be insane; but, after a longer acquaintance with the case, almost every one who saw her became convinced that she was merely playing a part. Well-educated physicians certainly need not have been deceived.

To make assurance doubly sure, however, further inquiries were made, and a gentleman was found who had been well acquainted with the patient's father, and who had a few years before been tolerably well acquainted with the patient herself. From this gentleman, and from various other sources, all the leading facts connected with her past history were ascertained.

It is sufficient to say (in this regard) that all her extravagant pretensions were entirely without foundation, and that she had practised various deceptions at other times and places.

Miss Montez was finally informed that a decision had been made regarding her case, namely, that on the one hand she was judged to be of sound mind, but that on the other her account of herself was regarded as essentially untrue; or in other words, that she was believed to be an impostor. Certain facts were mentioned, to show that the latter opinion was not without proof, whereupon she was induced to state the leading points in the history of her past life; and her statements were found to agree in all essential particulars with the accounts already gained from other and diverse sources. The only points of especial interest in this connection were her statements regarding the fits and her assumed character as princess. The fits, she said, were induced voluntarily, although she soon passed into an abnormal state that was for the most part, if not entirely, beyond her control. The blood was from her mouth. The *role* and title of princess, she said, were invented by the parties who engaged her to lecture at Steinway Hall, for the purpose of attracting public attention; and that she had subsequently enacted the character then assumed on her own account.

CASE X.—C. J. was fifty-six years of age when admitted to the asylum. He was accompanied by his family physician, and had been told that he was required at the asylum as a witness to the execution of certain papers for which service he would receive the sum of ten dollars.

The statement of his case, as given by the family physician, was as follows: "Patient has always had a violent temper, and has often been violent in his language, but never until within two years past has he shown any decided symptoms of insanity. For many months past has thought that his wife kept a house of assignation; has sometimes exposed himself improperly at the door of his house; is taciturn and suspicious, and at times noisy, and threatens violence to his family and friends. Is not known to have any suicidal tendencies. General health has been good. No exciting cause known, unless it be a wound received on the head more than fifteen years

since. No hereditary tendency known. First attack. Duration of the attack about two years."

On a personal examination, patient conversed connectedly and intelligently. He denied the truth of some of the statements of his physician, and others he explained in a way that was at least plausible, and not at all improbable in the nature of things. For instance, he denied that he had ever improperly exposed his person at the door of his house, but admitted that very early in the morning or very late in the evening he might have gone to the door in his dressing-gown, drawers, and slippers. After his admission and during his residence at the asylum he was kept under close observation, and was found always to conduct himself in a quiet, gentlemanly manner; and to converse rationally, unless, peradventure, some of his statements were based on insane delusions. Of this, however, there was no evidence.

A few days after the admission of C. J., a protest against his confinement as a lunatic, signed by five respectable citizens, was sent to the Board of Commissioners of Charities and Correction. They ordered an immediate investigation and report regarding his mental condition. Since he had been under observation, too short a period of time to render an opinion justifiable without other evidence regarding his past life and history, the testimony of thirteen persons who had been most intimate with him was carefully taken under oath.

Several of these witnesses were strongly of the opinion that C. J. was insane, while others, with opportunities for observation at least equally good, were of the opinion that he had always been of sound mind.

The evidence adduced was in brief as follows :

Since the date of his marriage, more than twenty years ago, Mr. J. had been irritable in temper and oftentimes abusive in language toward the members of his family. Fifteen years ago, after he had been married six or seven years, he directed his wife to write a very abusive letter to his father in Germany, calling him a robber, a thief, and other opprobrious epithets. He had been inimical to his father since his boyhood, and chiefly because his father had apprenticed him to a tailor, when he himself wished to follow some other pursuit. His wife

stated that he had always been too nervous to write, when irritated, or about any subject that annoyed him; and hence that he had compelled her to write the letter in question. About eight years ago he had dragged his eldest daughter, then twelve years of age, from the street to his store by the hair of her head, because, in opposition to the views of her mother, he wished her to leave school and assist in the store. About six years ago he took his son, ten or twelve years of age, in his arms, and, as his wife and daughter believe, was about to place him on a range heated to redness, when they interfered and prevented the deed.

During the past eleven years he had been seen on very many occasions by several witnesses, other than members of his own family, when greatly excited in manner and abusive in language. Almost every day he would scold in such a loud, angry tone of voice as not only to disturb the inmates of his own house, but also people who lived in the neighboring houses. On several occasions he had used violence against his wife, so that she carried the marks upon her person for several days. During the past two years his irritability and violence in language and manner had much increased. He would often call his wife and daughter prostitutes, and the house a house of prostitution. Has been heard to say of them, "I will kill you, I will kill you all together." At times would look about the house at night, as he said, to see if there were any men concealed on the premises. On several occasions arose for this purpose after he had retired for the night, saying that he would see if any of these good-for-nothings were about the house. Sometimes he was good-natured and agreeable, and he would then deny the fact of having been excited, abusive, or violent, on a previous occasion. One of the physicians who joined in procuring the commitment thought intemperance was the cause of his improper sayings and doings, but other witnesses testified that he drank only in moderation. The fact was pretty well established that he was more irritable in the morning than at any other time of the day, and this would seem to indicate that the use of intoxicating drinks had at least exerted an unfavorable influence on his disposition. The above points are the principal ones urged to prove that Mr. J. was of unsound mind.

Witnesses who had seen Mr. J. almost daily during the preceding three or four years testified that they had never seen him excited or angry, save when speaking of the unkindness and abuse of the members of his own family toward him. The subjoined affidavit will serve to express the facts noticed, the inferences made, and the opinions entertained by this class of witnesses.

C. B., being duly sworn, says that he is a "practising physician, and has practised as such in the city of New York for thirty years last past; that for upward of two years last past he has been acquainted with Mr. C. J., now confined as an alleged lunatic in the asylum on Blackwell's Island, and has been in almost daily intercourse with him during the whole of that period, and has observed his conduct, manner, and deportment, and found him always cool and collected in his ideas, correct in his opinions and judgment, of even mental temperament; and of sober and steady habits. He never manifested any symptoms of monomania, insanity, or unsound mind. Deponent further says that he was informed and believes that the domestic relations of the said C. J. were unhappy, in consequence of constant efforts by his wife and family to coerce him into arrangements that he believed would operate injuriously to the peace of his family, and it was in consequence of his refusal that every effort has since been made by the family to make his residence at home unbearable, and to compel him to leave his own house; and if he has occasionally given vent to bursts of anger, it was, in deponent's opinion, only in consequence of the cruel treatment to which he had been subjected by his family, and evidence of his just indignation by reason thereof. That, after a full and careful examination of all the alleged symptoms of insanity charged against the said C. J., deponent is of the opinion that he, the said C. J., is not of unsound mind in any respect, or in any degree, but is as sane as the majority of all people out of lunatic asylums."

The above was duly signed, and acknowledged before a notary public.

The following facts were also elicited in the course of the investigation: Several years ago, Mr. J., together with his wife, had opened, and for some time carried on, a store of fancy

goods, Mr. J. having in charge the money, the buying, and the keeping of the accounts, and his wife assisting as saleswoman. Fine laundry-work was also introduced as a part of the business, and of this department Mrs. J. took sole charge. This latter branch gradually increased in importance, until finally the fancy-goods business was entirely discontinued. The whole affair, including receipts, payments, and management, thus very naturally fell into the hands of Mrs. J.; her husband in the mean time doing a small business on his own account in pinking, etc., in another part of the building. This state of things was a cause of much domestic trouble and altercation; the wife claiming that she should have sole charge of the management of the business, and of the income, and Mr. J. claiming that he also should have a voice in the management, and in the disposition of the receipts, for the reason that he was the head of the house—had virtually commenced the business, and had invested several thousand dollars in the concern. Without entering into the merits or demerits of either side of the question, it was evident that this state of affairs had been the source of much domestic strife and ill-feeling, and was a sufficient cause for much of the excitability and abusive language on the part of Mr. J. that had been observed. In fact, there was no doubt that his natural irritability of disposition had been increased by this domestic feud, and the more especially since the whole family was so arrayed against him that he was left in a hopeless and insignificant minority.

Another fact was sufficient to account for the extraordinary irritability, strife, and exhibitions of anger, that had been observed during the last two years. A young man, whom Mr. J. did not approve, was paying his addresses to Miss J., the eldest daughter, notwithstanding the opposition of her father. The young man's suit was approved and encouraged by all the other members of the family. A family quarrel was the result. Mr. J. did not wish the suitor to visit his house at all, but claimed that, on the contrary, he came and stayed at unseasonable hours, and also that, since he had been paying his addresses, his daughter had on more than one occasion been away from home at an unseasonable hour of the night, and without a proper escort. He acknowledged that he had ex-

pressed his disapprobation of this conduct in strong terms, saying that his wife and daughter were acting like prostitutes, and using other expressions of a similar kind; but he denied having said that they really were prostitutes. He also acknowledged having searched the house as above mentioned, but said he had reason to suspect that his daughter's suitor was making unseasonable and clandestine visits at the time, and that his object was to find him, and eject him from the house.

Mr. J. claimed, on his part, that he had been treated by his wife and daughter with neglect, contumely, and positive abuse; that his wife had fastened the house against him; had thrown his clothing into the street from the window; and had thrown scissors, dishes, and sticks of wood at him with such violence as to put him in fear for his personal safety.

On the occasion of the first interview with Mrs. J., she was asked by the resident physician if she had ever at any time thrown dishes, sticks of wood, or other missiles, at or toward her husband, in such a way as to give a color or basis to his statement that she had committed these acts of offence. She positively asserted that she never had. On the next day, when confronted with her husband, and charged by him with having committed these acts, she acknowledged that she had thrown certain articles toward him with some degree of force, but claimed that she only intended to frighten him, when she feared that he would do her an injury. In reply to a question, she said that she did not think her husband was at that time or ever had been insane.

From the appearance, bearing, conduct, and conversation of Mr. J., while at the asylum, and from a careful study and analysis of the testimony taken, the opinion was formed that he was not insane; and he was discharged from the asylum as an improper subject.

Four months after his discharge, Mr. J. was visited and examined with reference to his mental condition, and inquiries were made of several persons who knew him intimately, in order to ascertain if there had been any subsequent manifestations of insanity. No reason was found for a reversal of the opinion formed at the date of his discharge.

Other illustrative cases might be adduced, both from the rec-

ords of the New York City Asylum and from the records of other asylums, but these will be sufficient to indicate the character of some of the cases to which reference has been made.

Under the State laws that regulate the admission of patients to asylums for the insane in the city of New York, physicians are required to make an affidavit that a patient is insane, is dangerous, and requires the restraints of an asylum, in order to secure a legal commitment.

By common consent the term *dangerous* receives a liberal interpretation. It may mean that a patient is violent, or only that he is incompetent to take proper care of himself, and hence needs care and treatment. The reasons on which the diagnosis of insanity *is* founded are not required to be stated. Hence, when mistakes are made, and medical superintendents of asylums receive under their care persons who are not insane, a considerable period of time for observation and study is often required. For the case may be one of recurrent mania of a dangerous character, that has been received during a lucid interval; or it may be one in which there is an ability to restrain and conceal the manifestations of insanity for a considerable period of time. The patient has been declared insane on the affidavits of two respectable physicians, and duly committed to an asylum by a magistrate, as a person dangerous to go at large. It would be considered as little less than an insult, if a medical superintendent should, after a limited observation of the case, and without a knowledge of the facts on which the diagnosis was made, reverse a judgment that had been founded on observations and inquiries made under the most favorable circumstances. Hence, it may be necessary to retain an improper subject in an asylum for a longer period of time than if he had been unmistakably insane at the time of admission, and had made a speedy recovery. The diagnosis must be made out and recorded, and this requires a positive judgment founded on well-ascertained facts.

A brief consideration of the methods that ought to be pursued, and of the principles that should be kept in mind during the examination of alleged lunatics, may serve to elucidate the subject, and to suggest the means and regulations adapted to secure the best results.

In the first place, the preliminary examinations and in-

vestigations of the physicians should be separate and independent. Neither should be biassed by the methods or the opinions of the other. Each will thus elicit evidence that might not otherwise be obtained. By a comparison of the results of their researches at a subsequent period of the investigation, doubtful points may be established or disproved, and the collateral evidence obtained through testimony may be compared and its reliability tested. Each physician, however, should base his ultimate decision on his own view of the facts and reasonings, unbiassed by the authority or opinions of his colleague. This the law contemplates, else the affidavit of one physician only would be required.

While conducting his investigations, two distinct sorts (classes) of evidence will demand the attention of the physician, and these should be clearly distinguished and separated in his own mind, since they differ not only in character but also in weight, and consequently in the influence they should have on his opinion. There is, first, the evidence gained from a personal examination of the alleged lunatic; and, secondly, the evidence gained from the testimony of others. The former ranks as positive knowledge; the latter only as indicative, collateral, or corroborative evidence. The physician is required to assert his belief in the existence of insanity in a given case, under the formality of an oath. It is clear, then, that the mere assertions of third parties cannot properly form the sole basis of that belief.

The physician, then, should personally examine the alleged lunatic, until some manifestations of insanity are exhibited in his presence. If one visit do not suffice, another should be made, or else the negative opinion expressed that he had been able to discover no evidences of insanity.

If a personal knowledge of the fact of insanity be required, of what use, it may be asked, is the testimony of others? Of the greatest use, and in many ways. The proofs of insanity gained from a personal examination may be perfectly satisfactory, as regards the simple existence of mental aberration; but yet no sufficient reason may yet have appeared why the restraints of an asylum should be imposed. The person in question may have manifested an insane delusion about something in no way connected with the ordinary affairs of life,

and that is very unlikely to exert any influence on his actions. He may believe that he holds communication with a man in the moon, regarding some highly theoretical and abstruse philosophical questions, and yet govern himself and his affairs with propriety and good judgment. This delusion may also be one of long standing, and hence not likely to be relinquished under any treatment or circumstances. Thus far no reason would appear why the patient should be secluded.

If, however, it should be learned, from the statements of friends and acquaintances, that this insane person sometimes made the confidential confession that his lunar communications had convinced him of the infidelity of his wife, and that her death alone could expiate her crime, no doubt would remain that the patient should be confined in an asylum for the insane, as a dangerous lunatic.

Information of the greatest importance is oftentimes thus gained regarding the character and duration of the insanity, and the habits and conduct of the patient. When the physician has been once satisfied of the existence of insanity from his personal examinations, he should avail himself of all the collateral and corroborative proofs attainable; both for the sake of strengthening his conclusions, and also for another purpose, that will shortly be mentioned.

Although in the study of difficult and doubtful cases it is usually best to commence with the personal examination of the alleged lunatic, in order that the mind may be quite unbiassed by the opinions of others; yet, since in certain cases the patient is inclined to avoid those topics in regard to which evidences of insanity are manifested, especially if he entertain a suspicion that he is himself the subject of inquiry, it is sometimes both proper and advantageous to first obtain the statements of unprofessional observers, at least regarding the leading points.

Both during the examination of the alleged lunatic and during the examination of witnesses who may testify in regard to his insanity, it is well to remember that there may be motives that improperly influence the witnesses, and even the supposed lunatic himself. If any such probable motives exist, the testimony offered should be weighed and scrutinized with especial care.

On the part of witnesses, motives like the following are liable to influence testimony, to the prejudice of the person against whom the charge of lunacy is made: Feelings of revenge or hatred may serve to invalidate testimony. A husband may find that his wife has become a burden, by reason of physical infirmities or advancing years; and that her presence at home interferes with certain projects to which he is strongly inclined. Ungrateful children may wish to get rid of the care or of the support of their aged parents. Avaricious relatives may wish to get the control of property that rightfully belongs to some other member of their family; or a party to a suit at law may wish to invalidate the testimony of a troublesome witness. It should also be remembered that insanity may be feigned for the purpose of escaping the punishment due to crime; to avoid pecuniary liabilities, or the fulfilment of disadvantageous contracts; or simply to secure a comfortable home.

After examining the alleged lunatic with the greatest care, and weighing the testimony offered with the most mature deliberation, the examining physician will sometimes find that, while he is quite satisfied that the person in question is really insane, and needs asylum care and treatment, he still has only vague and indefinite notions regarding the evidence on which his diagnosis has been based. The conviction is very strong in his own mind that his patient is insane, and he may flatter himself that a generalization of all the particulars that were in his mind but which have escaped his memory, and the impressions gained from his peculiar knowledge and skill as an expert, but which he cannot intelligibly express to others, are sufficient bases for his opinion. This, however, is not enough. He should be able to give the reasons for his belief in such terms as would be intelligible and convincing to other intelligent physicians. Otherwise he does no more than an unprofessional observer who believes a person insane simply because he seems to him to talk and conduct himself in a crazy manner.

It is true that an opinion may properly be formed from a generalization of many particulars. Still the particulars should be sufficiently definite to admit of a clear statement. So also

it is true that an expert may properly be influenced in making up his opinion by acts and appearances, for which he would find it difficult or even impossible to give an exact expression. Still his impressions thus formed should not be the sole basis of an opinion in a matter of such importance.

Now, this confusion and uncertainty of ideas arise in great part from want of method, from neglecting to write down the facts ascertained during the course of the investigation while they are yet fresh in the memory, and from not giving an exact expression to the conclusions that have been deduced. Nothing tends more to give clearness and definiteness to our notions than the exercise of expressing them in writing. Hence it would be of great advantage to the examining physician if this were always done. If his written statement be satisfactory to himself, his conclusions are very likely to be correct; if he fail in clearly expressing the grounds of his diagnosis, he will feel satisfied that the case is still in doubt.

There is another reason why the general diagnosis, and a statement of the facts on which the diagnosis is based, should be reduced to writing. It is, that the affidavits affirming the fact of insanity, to the best knowledge and belief of the testators, should be something more than a mere expression of opinion. The facts on which the diagnosis was founded should be included in the affidavits, the proper distinction being made between such facts as were within the personal knowledge of the testator, and such as were learned from the testimony of others. The statements of facts would thus become a matter of record, and be available for reference at a subsequent period if required.

There is still another reason why the statement of facts above alluded to should be reduced to writing, and included in the affidavits of the examining physicians.

It is exceedingly desirable that medical superintendents of asylums for the insane should be made acquainted with the history of the patients who are placed under their care, in every particular that has a bearing on the question of their insanity, including hereditary and congenital influences, physical injuries and diseases, predisposing and exciting causes, natural characteristics and habits, and the duration, character, and manifestations of the disease.

Now, patients are frequently received at asylums, especially at city institutions, with regard to whose history no information whatever can be gained by the physicians in charge. Sometimes only negative evidence can be obtained from the patient. Perhaps he cannot or will not tell his own name even, so that there may be doubts regarding his identity as the person named in the commitment. If two such cases be received at the same time, the difficulties are still further increased. The patient may have been intended for another institution, or one person may have been designedly substituted for another. Or, if this difficulty do not exist, there may be important points in regard to the mental or physical condition of the patient that should be known at an early date. The patient may have suicidal or homicidal propensities; he may be treacherous and violent; he may be on the verge of starvation through prolonged voluntary abstinence from food; he may suffer from some physical disability that needs prompt attention, but is not of such a nature as to attract immediate notice; or he may have been exposed to some contagious disease.

At the very least, the examining physician must be aware of the circumstances relating to the patient's mental and physical condition for a short time previous to his commitment. A knowledge of these is highly desirable, even if nothing further can be learned. In a scientific point of view, all the facts bearing on the patient's condition and past history are of importance.

It has already been recommended that examining physicians write out a statement of the facts on which they base a diagnosis of insanity, for the purpose of enabling them to obtain clearer and more definite notions regarding the mental status of the alleged lunatic. It is also highly desirable that they transmit this statement, with the patient, to the asylum in which he is to be placed; that the statement include both points of diagnosis, and all the causes that have probably had an influence in producing the insanity, as far as these causes could be ascertained; and also that the preparation and transmission of this statement be made obligatory by law. If this were done, the confinement of sane persons in asylums for the insane would be almost entirely, if not absolutely, prevented.

As aids in carrying out this project, blank forms should be furnished to the examining physicians, arranged under the following divisions and titles:

The entire document might be entitled as follows: *Facts and opinions adduced by* _____, *M. D., of* _____, *No.* _____ *of* _____ *Street, in the case of* _____, *an alleged lunatic.*

The first division should be entitled thus: *Name and personal description.* The personal description should include the nativity, age, height, color of hair, color of eyes, civil condition, education, religion, occupation, and any other facts that might serve to identify the person. If a foreigner, the date of arrival in this country, the name of the ship on which he came, and the port of entry should also be designated, both as an aid in identification, and as an aid in deciding to what State the charge of the patient belongs.

The second division should be entitled thus: *Facts observed and adduced by* _____, *M. D., as evidences of the insanity of* _____.

Under this heading should be included references to all the physical and mental conditions bearing on the question of insanity that an examining physician would be likely to observe; as, for instance, the condition of the pupils, tongue, circulation, temperature, etc., also the mental condition in regard to memory, power of apprehension, irritability, antipathies, hallucinations, illusions, delusions, exaltation, depression, etc.

The third division might be entitled thus: *Facts adduced as evidences of insanity, and presumable causes of insanity, in the case of* _____, *that have been ascertained by* _____, *M. D., on what he believes to be reliable testimony.* Under this division should be enumerated points bearing on the mental condition, as under the second division, peculiarities in the habits, propensities, disposition, conduct, etc.; mental causes, such as losses of property or of friends, domestic troubles, disappointments, religious excitements, etc.; physical causes, such as hereditary and congenital influences, loss of sleep, injuries to the head, physical diseases, etc.; and such other particulars as would naturally belong to this category. Under this division should also be stated the number,

duration, and character, of any previous attacks of insanity that may have occurred.

The fourth division should be entitled thus: *Affidavit of M. D., regarding the mental condition of* . Under this division it should be stated that the testator visited the alleged lunatic at a specified place or places, on a specified day or days, and for specified periods of time; that he obtained what he believes to be reliable testimony from parties who should be named; that the results of his investigations are embodied in the preceding divisions, and that on the facts there stated he bases the opinion that is of unsound mind, and is a fit subject for care and treatment at an asylum for the insane.

The specific points of inquiry, being thus methodically arranged and printed in the blank forms, would serve as great aids to the examining physicians during the prosecution of their investigations. One form should be provided for each physician, and, as intimated above, these affidavits should be forwarded with the patient to the asylum, the court that issues the commitment making such record of the facts as legal safeguards or custom may require.

The law should also require that a personal examination on the occasion of which evidences of insanity were observed should have been made within a limited and specified period of time previous to the making of the affidavit; also that the patient be actually received at the asylum for which the commitment is made out within a limited and specified period of time thereafter; and also that a want of compliance with either of these conditions will render the whole procedure invalid.

The question now arises whether these examinations, investigations, and affidavits, should be made by general practitioners of medicine, as at present, or whether these duties ought not rather to be performed by men supposed to be especially conversant with the subject, and who have been duly authorized by law to take sole charge and responsibility in cases of lunacy.

The following considerations may be urged in support of the last-named method: It is acknowledged that sane

persons are sometimes committed to asylums for the insane. It is also acknowledged that some cases of insanity are difficult of diagnosis, and that general practitioners of medicine are in many instances poorly versed in the subject of mental diseases. Hence it may very naturally be inferred, on a cursory examination of the subject, that experts in insanity should be appointed to conduct all investigations, and to make all decisions in cases of lunacy.

There are many and very cogent reasons, however, in favor of the existing method ; and these reasons will be still stronger when the method has been improved in some way similar to the one just recommended. Some of these reasons are as follows :

It is of great importance that there be no obstacles in the way of placing such patients as are really insane in asylums. Any difficulties, publicity, or unusual proceedings, would serve to hinder their early admission, and hence diminish the probabilities of a cure. Under the present system, even if it were modified as recommended, the difficulties are very slight. The friends have only to call in the family physician whom they consider at the same time as a family friend. The physician usually is already well acquainted with the patient. He makes a visit without causing any disturbance or excitement. He makes a diagnosis with comparative ease, from the fact that he is able to compare his personal knowledge of the present condition with his personal knowledge of the past condition of the patient. Oftentimes he is thoroughly conversant with the patient's physical and mental history from childhood. He may even be acquainted with the family history and hereditary influences. If required by law, a neighboring physician may be found who also knows the leading points in the case. They have only to make the necessary affidavits, and a commitment is secured.

The evidences of insanity in the case of a very great majority of those who are placed in asylums for the insane are so clear and unmistakable that no difficulty exists in the way of making the proper diagnosis. If difficulties are experienced, the form of affidavit proposed would be found of great assistance, and might perhaps remove all difficulties. In any event,

a consultation would be available if the family physician should finally distrust his own abilities or judgment.

General practitioners of medicine ought to have a fair knowledge of mental diseases, as they are now expected to have of surgery or of midwifery. Every physician does not claim to be an expert in surgery, and to give the most profound opinion on a case of extraordinary obscurity or difficulty, yet he is expected to understand and scientifically treat the great majority of cases that are committed to his care. He should, in like manner, be able to comprehend the great majority of cases of lunacy that come under his notice.

It is not every person who is insane that needs to be secluded in an asylum. The advice of a general practitioner of medicine may at times be required in the treatment and management of these cases. The condition of the mind exerts a very important influence on the condition of the body, and *vice versa*. Physicians need fully to appreciate the importance of these reciprocal influences. The approach of insanity is often slow, and so obscure as to escape the notice of those who have given no attention to mental diseases and their causes. If detected at an early day, the actual outbreak of the disease might without doubt oftentimes be averted. General practitioners have much better opportunities than superintendents of asylums for observing the *prodromata* and the early stages of insanity, and hence are their natural allies both in the general study of the disease and in the study of any particular case; but to afford really valuable assistance, either from a practical or a theoretical point of view, they should be reasonably well informed on the subject in question.

For such reasons as these it has become a well-accepted principle that general practitioners of medicine ought to be conversant with the subject of mental diseases. One after another, the different medical colleges are adding professors of psychological medicine to their staff of teachers, so that very soon all graduates in medicine will be as well instructed in regard to mental diseases as they now are in other branches of the science.

If, however, by the appointment of a particular set of men to make out the diagnosis and decide regarding the cus-

today, in all cases of insanity, physicians should be led to infer that mental diseases are too difficult of comprehension to be understood by the profession in general, they would be very unlikely to increase their fund of information on the subject. If they were not called upon to investigate those cases that naturally come under their notice, they would be quite certain to lose all interest in the study of mental diseases. This would be a retrograde movement—a result much to be regretted, both in the interests of science and of the community at large.

There are two classes of lunatics for which, thus far, no improved method has been suggested, in accordance with which they may be placed in asylums for the insane. Reference is made to criminal lunatics, or those that in any way become subjects of a legal investigation; and cases in which no evidences of insanity could be detected by the examining physicians as a result of their personal observations, but in which unprofessional observers, of greater or less reliability, have noticed presumable evidences of insanity.

Some of the objections that have already been urged in this paper against a jury-trial, as a method of securing the commitment of lunatics to an asylum, are equally cogent in the case of criminal lunatics in behalf of whom the plea of insanity is interposed, and indeed in all cases of lunacy that for any reason become causes of litigation. Ordinary investigations in cases of lunacy have, in many instances, entirely failed in eliciting the truth and establishing justice, through faulty methods and lack of the requisite skill and information on the part of judges and jury. Facts and opinions that are presented are not rated at their just value. The counsel for each side often submit hypothetical cases to the medical expert which differ in essential particulars, while neither hypothetical case is likely to be a true statement of facts. The expert-testimony may thus be apparently at variance, and hence considered unreliable, although the experts might entirely agree if they were to testify regarding the same facts. Experts are themselves liable to be unconsciously biassed, from having been employed by one of the parties to a suit, and remunerated for testimony expected to be in favor of a particular side.

These are among the reasons why some mode of procedure different from the one now in use should be adopted in the legal investigation of cases of lunacy. The most rational and effective mode would seem to be the appointment of men who have the confidence of the medical and legal professions, and of the community at large, and who are thoroughly informed on the subject of insanity, both in its medical and its legal aspects, as a court of inquiry, in all cases of lunacy that are to be submitted to the civil or criminal courts; and that this court, or commission in lunacy, be in its peculiar province clothed with all the powers and privileges possessed by other courts.

The difficulties that now exist in those cases in which the examining physicians can detect no evidences of insanity as a result of their personal observations, but which are probably insane, are these: Since the evidences of insanity are gained from third parties who may or may not be reliable, or who, if reliable, may seem to differ in essential particulars, these parties should be examined under oath, and in accordance with the methods adopted for the examination of ordinary witnesses. But general practitioners of medicine do not have the power of administering oaths, nor are they skilled in the methods of eliciting truth by the examination of witnesses. These cases would also be proper for the investigation of such a court or commission in lunacy as the one above recommended.

The design of this paper has been simply to suggest certain improvements in the methods of examining alleged lunatics, and of placing them in asylums for the insane, to the end that mistakes in diagnosis may be avoided, and also that medical superintendents of asylums may be promptly advised of facts that are of great value, both in a scientific point of view, and as aids in devising the early and rational treatment of their patients.

ART. IV.—*On the Phenomena and Movements of Rotation consecutive upon Removal of the Brain.* By M. ONIMUS.
Translated from the *Revue des Cours Scientifiques.* By
C. N. HAMMOND.

ON THE MOVEMENTS OF ANIMALS DEPRIVED OF THEIR CEREBRAL
LOBES.

SINCE the celebrated experiments of Flourens, it has been known, in an indisputable manner, that all the acts of vegetative life are entirely independent of the cerebral lobes, and, that an animal deprived of its brain continues to live as well as formerly, with this difference alone, that it loses all will and all instinct.

With the superior animals, as with the inferior ones, the removal of the cerebral lobes does not cause any of the movements which existed before to disappear. Only, these movements take certain particular characters. In the first place, they have more regularity, they have the true normal type, for no psychical influence modifies them; the locomotive apparatus is put in motion without restraint, and it can almost be said that the entire series of movements is more normal than in the normal state.

In the second place, the movements which are performed, immediately follow certain excitations; they could not be otherwise. The frog put in to the water must swim, and the pigeon thrown in the air must fly. The physiologist can then determine, at his will, such and such an act in an animal deprived of its brain, restrain it or stop it; he can foresee the movements and affirm beforehand that they will take place in certain conditions, absolutely as a chemist knows in advance the reactions which he will obtain in mixing certain bodies.

Another particularity of the movements which ensue when the cerebral lobes are taken away, is their continuation after a first impression. On the ground, a frog without a brain being irritated, makes generally two or three leaps or more; it is rarely it makes but one. Placed in water, it continues the motion of swimming until it meets with an obsta-

cle; it is the same with the carp, the eel, etc. The pigeon continues to fly, the duck and goose to swim. They may be compared to a spring which requires an impulse in order that it may act, and which stops at the slightest resistance. But what is remarkable, is the continuation of a state thus determined, and one cannot help bringing together the facts which are observed in animals deprived of their cerebral lobes, with those which constitute one of the characteristic properties of inorganic matter. Put in motion, the animal without brain maintains this movement till the exhaustion of the conditions of motion, or until he meets with some resistance. Put in repose, he remains in a condition of inertness until some exterior cause forces him out of it. This is the living inert matter.¹

ON THE EXCITO-MOTORY STIMULATIONS IN ANIMALS WITHOUT CEREBRAL LOBES.

It is indisputable that the phenomena which we have just related have excito-motory and senso-motory stimulations for their cause. With the frog, for example, the contact of the body with the ground causes it to take its normal attitude, and when the frog is placed in water, as M. Vulpian says, "an excitation is produced over the entire surface of the body in contact with the water; this excitation provokes the mechanism of swimming, and this mechanism ceases to act as soon as the cause of the excitation has disappeared, by the removal of the frog from water.

The explanation given by M. Vulpian is, however, exact only in a certain measure; for the frog remains immovable in the water, as soon as it meets with an obstacle to its motion, although the excitation produced by the water on the surface of the body still remains, and on the other hand, with the pigeon, the surface of the body is identically pressed upon by the air, whether the wings are extended or closed, and, notwithstanding, it is obliged to fly as soon as it fails in obtaining a resting-place. There are other causes of stimulation besides the

¹ See, for the details of experimentation, the *Journal d'Anatomie et de Physiologie*, October, 1871.

impression of the cutaneous nerves.¹ According to our view, these causes are, the unity of the movements which exists with animals deprived only of their cerebral lobes, and, in second place, the necessity of maintaining equilibrium.

Unity of Movement.—We insist upon the following phenomena: When the frog is swimming, and a solid body is placed against one of the front-feet, the corresponding hind-foot immediately moves, and is drawn to the body in contact with the front-foot. It is the same if the front-foot is rendered immovable. Reciprocally, if the frog is motionless on the surface of the water, and if the front-foot is moved, the one behind moves also, and the animal begins to swim.² In a word, and in a general manner, with animals deprived of their cerebral lobes, if one member is put in motion, all the others move also; if one is put in repose, the others enter into an equal state of rest. It is very rarely with these animals that the movement is confined to one member, and all excitation, every changing of position in a member, inevitably induces analogous modifications in the other parts.

This unity of movements distinguishes animals deprived of their cerebral lobes, not only from perfect animals, but also from those in which the spinal marrow is separated from the encephalic centres.

With the frog, of which the marrow is cut near the bulb, or a little below it, if a member is displaced, the action has no influence on the movements of the animal. If one of the feet is lightly moved, the subjacent muscles alone are contracted; if they are more strongly excited, the whole foot is drawn up, but the rest of the body remains immovable. You must have an excitation sufficiently strong to cause the other feet to be put in action. In one word, at each excitation, according to its force, movements, more or less extended, take place, which can in all cases be limited to a single group of muscles.

¹ With frogs without cerebral lobes, and from which the skin has been entirely removed, the movements of swimming are continued when they are placed again in water, which proves that the excitation of the cutaneous surface is not the true cause of these motions.

² If the front-feet are moved, those behind always moves also, but the hind-foot can be put in motion without the front-feet changing their position.

It is no longer thus with a frog in which the marrow remains united to the cerebellum; the movements which succeed an excitation, whether it be weak or strong, are always grouped.

If a drop of vinegar is placed on the foot of a frog, whose marrow is separated from the brain, the foot is drawn up immediately; then the other one makes coördinate movements to remove the cause of irritation. On the contrary, the frog which is only deprived of its cerebral lobes, makes several leaps, then only moves one or the other of its feet. With the frog in which the marrow alone exists, muscular contractions succeed every excitation. These are always in proportion to the force of the excitation. In the frog with the cerebellum intact, excitations can be made without any movement taking place, but, whether forcible or not, the moment they provoke a reflex action the result is the same, that is to say, a coördinate movement, which produces a leap.

According to the excitation and according to the nature of the impression produced upon the cutaneous sensitive nerves and the nerves of muscular sense, it forms between the different regions of the nervous centres a common understanding, which has for a regulator the cerebellum and the encephalic isthmus.

When the marrow is entirely separated from all the centres of the brain, the reflex actions, though still coördinated, have no longer the same characteristics; they remain limited to a few groups or to one muscular group only.

Finally, there is a logical consequence which confirms the experiment. There is between the medullary actions and those produced by the encephalic centres (except the cerebral lobes) a kind of equilibrium, which is modified each time that one or the other of these regions is more or less excited or weakened. If the marrow is irritated, the influence of the encephalic isthmus and the cerebellum is less pronounced. The contrary is the case if the marrow is weakened, or if the encephalic centres are irritated.

Necessity of Equilibrium.—With animals deprived of their cerebral lobes, there is a constant phenomenon, that is, the continued and forced tendency to maintain the equilibrium. We have seen with the frog, the carp, the eel, the

pigeon, the goose, duck, the mammiferae, etc., that each time their centre of gravity is displaced, there follows a series of coördinate movements, the object of which is solely to reëstablish the equilibrium. An insect decapitated always remains resting on its feet, and is not able to take any other position. Examine a frog motionless on a plank on the surface of the water, and lower the board slowly in such a manner that the frog is immersed in the water. Most of the time, notwithstanding the impression upon the teguments, the frog will remain immovable; but, if the board is gently moved from under the frog without deranging the animal's position, it remains immovable; if, however, you incline the board to one side or the other, it immediately recovers from its motionless state. The loss of the equilibrium acts more energetically than the impression of the water on the teguments. Move a carp from right to left, and as soon as it is let alone it retakes its normal attitude. If you place a duck on one of its sides, whether on ground or in the water, it immediately resumes an upright posture.

If, for the coördinated movements, we have always insisted on the conjoined action of the encephalic isthmus and cerebellum, it is not the same for the motions for maintaining equilibrium. For these are influenced by the cerebellum alone, and it is easy to establish this fact experimentally. From the time it is injured or destroyed, the animals remain indifferently upon one side or the other, and they do not endeavor to regain their equilibrium when it is lost. In certain cases equilibrium becomes impossible, as there is a tendency to fall on one of the sides.

When the cerebellum is removed from the superior animals, as the pigeon, the duck, and the goose, the coördinated motions still exist, but without regularity. When on the ground, the animal stumbles and appears by its walk to be intoxicated. When placed on its back, it struggles, endeavors to raise itself, but does not succeed easily. When the cerebellum is retained, if the animal is placed on its back, or thrown in the air, etc., it always immediately returns to its normal attitude. If the cerebellum is removed or greatly injured, the movements are retained, but without order and regularity;

the motions of flying and those of swimming are performed in violent jerks, somewhat spasmodically; with the duck, for example, each foot being put in motion by a severe shock, it contracts at random, without any definite object; as long as this continues, or the cerebral lobes are alone removed, the contractions are coördinate, they have fulness and a certain grace. We have even said, in order to explain the fact properly, that the movements appear more normal than in the normal state.

However, the reflex motions, owing entirely to the influence of the marrow, are equally coördinate, as the experiments of Pflüger prove. The removal of the cerebellum does not cause the coördination of such or such a limited motion to disappear, but it does in regard to the complicated movements—such as jumping, moving, swimming, and flying.

Moreover, the animal is no longer able to maintain its equilibrium; it has no longer that forced necessity which, with animals deprived only of their cerebral lobes, is so remarkable. The cerebellum serves more for preserving the equilibrium than for the coördination of movements. According to our idea, this is its principal function, and the organ acts in this sense, whether the animal is in motion or repose.

CENTRES OF LOCOMOTION.

It may be concluded, from the greater number of facts which we have related, that the motions of animals, whether they be of inferior or superior types, are produced by certain peculiar mechanisms, or by the centres of locomotion which exist exteriorly to the brain. These centres are essentially passive, they have no spontaneous action, and are not put in motion unless they are excited, either by a peripheral action or by the brain.

A direct action of the brain on each muscle should not be allowed in the habitual movements which appear entirely voluntary. One is obliged to observe that there exist, outside of the brain, centres of movement which intervene between the will and the outward actions. The will puts in motion such and such a centre, and this also determines the action of certain muscular groups. It is known, moreover, that, ac-

according to the use and education of the muscles, certain of them can, with great difficulty, be put in motion alone, and that the contraction of one muscle animates that of another as the will opposes it.

There are in the centres belonging to the brain, outside of it, coördinate centres and directors of the movements, which, we may say, preside over the outward actions (change of place, swimming, flying, etc.), and which only receive from the brain, the general order in which to perform certain movements. The whole of the motions which are produced by means of the centres of locomotion, without the influence of the brain, are of two kinds: one is of the instinct or is hereditary, and the other is habit. Both are forced, but they differ, as the first is found in all animals, whether they are young or old, while the latter is only met with in old animals. The first is *of nature*, the latter of *second nature*. It is thus that a duck, which has never been in the water, begins to swim regularly when placed in it after the removal of the cerebral lobes;¹ but it does not have certain habitual movements of the neck, as has an aged duck, deprived of its brain. An old pigeon, although deprived of its brain, places its head beneath its wing when it sleeps; often even smooths its feathers. With young pigeons we have never observed these acts, although they execute other movements in a manner just as normal as the old ones; their flying is very regular, even though attempted before they leave the nest.

It is, then, probable that there are formed, from use, certain relations between the cellular groups which cause the whole of the movements, that become just as forced and just as necessary as those which are owing to the actions of instinct. In addition to these movements, some hereditary and of instinct, and the others of habit, there are still the reflected actions

¹ We have removed the brain from young ducks hatched and brought up by a chicken. These ducks have never been in the water, and only drink out of a very small and narrow trough into which they cannot plunge. We removed the brain from four of these little ducks, and, notwithstanding this, on placing them in a basin, they immediately began to swim. Their motions of swimming were regular, and this action was as forced and just as inevitable to them as to other ducks which had lived on the water.

produced by the predominant influences of the moment, or by the temporary instinct. It is thus that, during the season of coupling, in placing the finger between the front-feet of a male frog from which the brain has been removed, the motions which are produced press the body placed between, as if it tried to draw near the female. This action is very vigorous and constant, and at this time all excitement, instead of preventing the other movements, only exaggerates them. With animals deprived of their brain, the centres of locomotion still exist complete, and, as we have already said, these animals do not differ from those which are not mutilated, except by the impossibility of entering spontaneously into action. It is necessary for them, in order to act, to receive an excitation, either exterior or interior. Exterior excitation is that by which we can procure an animation of the peripheral nerves; the interior excitation is that which the brain produces, and, if one may say—in point of view purely physiological—the brain has no other action than to put into activity the different centres of motion. It is a simple movement, with the important difference that the external impressions can only determine a certain number of motions, while the brain causes an immense variety.

The artificial excitations which we can produce are always formed by the irritation of a few sensitive nerves, however much the movements may differ according to the mode of impression and the regions. The excitation of one member produces jumping, an excitation of the same kind on the thorax causes croaking; if the whole frog is surrounded, it endeavors to escape by slipping through the fingers; if it is thrown into water, it swims. Exterior impressions can then determine a great variety of movements in the mutilated frog; one understands, with the utmost satisfaction, how much the brain in its turn can cause different motions.

If, with a frog deprived of its cerebral lobes, the movements are so natural as to appear voluntary, it is evident that the smallest portion of the brain is sufficient to produce all the actions, or almost all of them, which exist in the animal which is not mutilated. In fact, the brain does nothing but determine the putting into action of the centres of motion. It is only

necessary, in order to produce this action, that a few cells should act spontaneously, that is to say, a few of the cerebral cells. It is for that reason that all the functions are still entirely performed, and that all the instincts remain with the ani-

FIG. 1.



Frog deprived of its Brain.

mals from which only a portion of the brain has been removed. Thus, as, in these experiments, one cannot judge of the intellectual or instinctive changes except by the disorder exhibited in their habitual actions, it is very difficult to appreciate well the consequences of partial mutilation of the brain.

Flourens, and, after him, Longet and M. Vulpian, may have been able to assume rightfully that a portion of the brain, properly restrained, is sufficient for the cerebral functions to subsist, but, according to our opinion, they have not the right to diminish any but the faculty of judging; the will is a faculty essentially *one*, residing in a single organ, and on which partial injuries of no great depth produce no effect. According to these physiologists, one may remove successively the parts corresponding to the two cerebral lobes, without being able to discover the slightest disturbances in the relations of the functions of central innervation, but, as soon as a certain limit is exceeded, all the faculties disappear simultaneously at a single stroke.

Some have compared these facts with the system of Gall; but, without wishing to defend phrenology, we do not think that these experiments can alone completely condemn it. Really, a few cerebral cells suffice to produce the exterior actions of locomotion, of flying, etc. As to the limit which must not be exceeded in the mutilations of the brain, it is the region where the brain communicates with the marrow; moreover, it suffices, without destroying any part of the cerebral substance, to separate by one section the communications of the brain with the other nervous parts, and immediately all the intellectual phenomena cease to be able to manifest themselves.

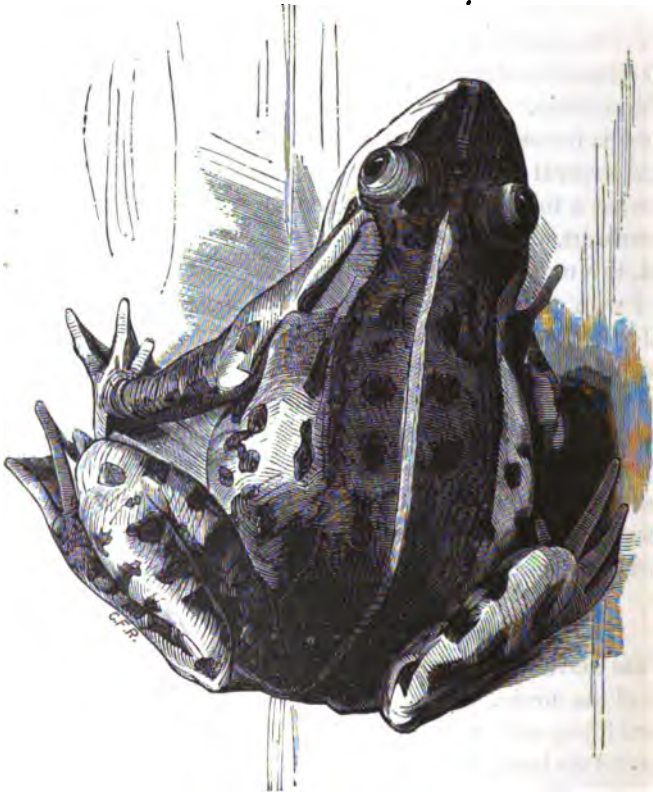
But is it not going too far to conclude from these facts that all the cerebral regions form but one single organ, and that this organ has a limited part for its centre, that partial injuries are insignificant, and that all the cerebral parts conspire to a single point, to a unity of function, which is, for example, to be compared with respiration? Each pulmonary lobe has really a local action, which is the same for all, and the whole produces hæmaturia. We do not think it is the same with the brain, and in all cases it is even erroneous to say that limited injuries of the cerebral lobes do not produce intellectual disturbances. The animals (frogs, ducks, pigeons, etc.) from which we have taken away a portion of the anterior lobes present much less vivacity, they allow themselves to be approached and easily seized, they mix less with the others, and are a little dull.

MOVEMENTS OF ROTATION.

The movements of rotation take place after injuries of a part of the brain. They take place, above all, after the unilateral injury of the cerebral hemispheres, the corpora striata, the optic thalami, the cerebral peduncles, the tubercula quadrigemina. The movements of rotation offer two distinct types: one is a circular motion, and the other of rolling. In the first case the animal remains in its normal attitude, but always with a tendency to go to one side, and thus describes a circumference more or less extended. In the second case the animal can hardly progress or move. From the time it begins to move, it is seized with a motion of rolling, and it turns over like a ball.

Circular Movements.—The circular movements exist, above all, when the brain has been injured. We have been fortunate enough to obtain them in a very distinct manner, but without exaggeration, in a frog from which we had removed the cerebral lobes of the right side. The motion was made to the left side, that is to say, from the injured side to the sound one.

FIG. 2.



Frog deprived of the Right Half of the Brain.

That which struck us in the attitude of this frog (Fig. 2) was, that the entire left side of the body had the bearing and exterior aspect of a frog without brain. The hind-foot of this side is nearer the body, and is drawn up as with the frog without brain (Fig. 1); the front-foot is equally less separated

from the body, and it has the position that we have constantly seen in the frog without brain.

At the same time the entire animal leans a little to the left side. This inclination of the body is neither constant nor forced with those animals which have only the circular movements; on the contrary, however, it is both constant and forced with those which have the motions of rolling.

The attitude of this frog changes, and even becomes reversed, when the animal is given chloroform; the left side, which was more drawn up, where the muscles experience a predominant tonic contraction over those of the right side, becomes weaker. This effect is declared more and more according as the influence of the chloroform becomes more manifest, until the moment when both sides are completely contracted; then the frog can no longer support itself on its fore-feet, and the hind-feet remain extended and immovable.

As the anæsthesia disappears, the foot of the uninjured side recovers itself, and approaches the body; that of the opposite side still remains extended. Then the latter becomes equally restored; the attitude of the two sides is then identical; but, when the normal state returns, the members of the side in relation with the cerebral injury are again drawn up, and cause the body to lean in their direction. There is, therefore, a direct influence of the nervous centres on the tonic contractions. With this frog, we have still the influence of the cerebral lobes on one side, but on the other side the centres of locomotion have a complete independence, and they act by themselves on the movements which take place on that side of the body. What happens when the animal dies? On the uninjured side the motions are formed according to the desire of the will, they are limited as the animal wishes; but on the other side they form in a mass, in an invariably automatic way. They consequently draw the animal toward their side, at the same time that the mathematical regularity of their contractions becomes, we may say, a dynamical centre for the movements of the opposite side, which are less regular. In the same way is explained the circular movement, the side corresponding to the cerebral injury being on the interior of the circle gone over by the animal. It is for the same

reason, and above all in the circular motions, especially when the circumference is a little large, that the rotation only takes place when the animal wishes to change its position, and very often does not begin until after the first moments of locomotion.

Now, several cases may present themselves, but they all return to the two following consequences: the cerebral influence is abolished, which determines the absolute independence of the centres of locomotion of the other parts of the brain, independence which is explained by a uniformity of forced and automatic movements, or else the centres of locomotion are irritated by a tumor, a puncture, etc., and then their dependence in relation to the cerebral lobes ceases momentarily, notwithstanding the anatomical communications which still exist. It is, above all, in this case, that at the moment of injury the impulse becomes invincible, and forces the animal to move. The centres of locomotion begin to act, and, as long as the excitation continues, the animal is submitted in an irresistible manner to the influence of these centres. Neither the will, the greatest emotions, nor even physical objects, prevent the members from contracting and moving.

A hunter related us the following fact, which appears very interesting to us in this respect: At a great distance he fired at some wild-ducks which were on the water; one of them could not fly away, and remained, turning round in a manner indicating giddiness. This duck had only received a slight lead-shot of little depth on the side of the head; it had absolutely no other wound in any part of the body. Now, what is curious in this fact, and that which greatly astonished the hunter, was that the duck could not fly away, although neither the will nor the means was wanting to it, and that it could not even plunge, as wild-ducks usually do when they are wounded, and not able to fly away. Notwithstanding the approach of the dog, and the evidently energetic action which its brain tried to exercise, it could only swim on the surface of the water with a forced movement of rotation.

When the injury is on both sides of the brain, a few of these phenomena are equally observed; only, as the action of the two sides is the same, the animal dies, the body being perfectly

straight. In a young cat, we, with our friend Charles Legros, injected some mercury by an opening made by means of a trepan, into the superior part of the cranium. At first, the animal acted as if giddy, then remained depressed and motionless. After some time, the mercury by its weight having arrived at the base of the cranium, the animal arose, and went straight in front till it reached the wall, made vain efforts to go farther, went to one side, and continued its course until it met with a new obstacle, and so on. It did not stop until exhausted, and fell from weariness, and still, until its death by compression of the bulb, the limbs moved in an irresistible manner without interruption. In a man upon whom was no post-mortem examination, but in whom there were incontestably all the symptoms of a cranial tumor, we have observed the phenomena to be almost identical with those which appeared in the young cat. When there was a crisis (toward the end of his life, these crises approached more and more), he rose, his eyes haggard, and walked straight in his room, only guided we may say by the habitual reflex actions of locomotion. After the crisis he remembered nothing at all of his walking.

Above all, it is evident that, in these different cases, there cannot be a question of paralysis, and that the phenomena are the result of the excitation of the centres of locomotion. These centres, if the influence of the brain is abolished, and if they do not experience a direct irritation, only act when they are urged to activity by the movements communicated to the opposite side, and then the uniformity of motion is forced and automatic, but regular, and without exaggeration. The result is a circular movement with an extended circumference, a motion which only takes place when the animal changes its position. On the contrary, if the centres are directly excited, the animation is forced and irresistible, and the animal is obliged to move in the way impressed by the centres.

Motions of Rolling.—In order to understand well the motions of rolling, it is necessary that we should give a few facts which have hardly been dwelt upon until now, and which are observed in reposing animals.

In injuries of the cranial centres, from the time that any part of the isthmus of the brain is injured, the animal has no

FIG. 2.



Frog in which the Right Half of the Cerebellum has been destroyed.

longer the same exterior deportment, it leans to one side or the other, according to the side on which the injury has been made. All the muscles of this side are then in a permanent state of tonic contraction.

The frog represented in Fig. 1, of which only the cerebral lobes on both sides have been removed, is remarkable for the regularity and symmetry of the position of its limbs. Placed in water, it remains on the surface, and the right side is absolutely on the same level as the left. But if the cerebellum of this frog or any other is injured on one side, although the cerebral lobes may be untouched, or have been removed, the exterior appearance immediately becomes as represented in Fig. 3. The cerebellum of this frog has been destroyed on the right side, and this entire side instantly experiences a permanent tonic contraction; the limbs are drawn up to the body, which inclines entirely to the right side. This attitude is so regular in these injuries, that one may affirm at sight the movement of rolling, and indicate its signification. The opposite side has an equally constant and typical attitude; a removal of the anterior limb from the side of the thorax always exists as represented in Fig. 3. When this frog is placed in water, it turns, the right side, we may say, serving for an axis of the movements. When in repose on the water, it takes the attitude as seen in Fig. 3. The right side of the body tends to sink, and the limbs on this side can never be on a level with those opposite. The latter, on the contrary, especially when both sides of the cerebral lobes have been removed, float on the surface, and counterbalance the influence of the opposite side. The hind-foot of the uninjured side remains extended, and always rests on a higher level than the one on the other side; the front-foot remains out of the water, and also the anterior part of the body.

The limbs of the injured side do not present any paralysis, but nevertheless their movements are more limited; they are not so much extended or variegated, and their actions do not coincide exactly with those of the uninjured side.

If, instead of pricking or greatly injuring one side of the isthmus of the brain, it is done on each side of the nervous centres, a little below the bulb, a tonic contraction is obtained

on both sides of the body, and the frog takes the attitude as shown in Fig. 4, which is, no doubt, due to a tonic contraction in the muscles of the whole body. When placed in water, the frog falls to the bottom, and remains immovable.

FIG. 4.



Frog in which the Encephalic Isthmus (pons Varolii) has been injured on both sides.

On considering successively the attitude taken by the frogs from Fig. 1 to Fig. 4, it is perfectly seen that, from the time the cerebral lobes have been excised, all injury of the other parts of the brain occasions a kind of tonic contraction in the muscular groups corresponding with the injured side. With the mammiferous animals this attitude equally exists, but these phenomena are less easy to study well with animals on the ground than with those which can be placed in water. With geese and ducks (Fig. 5), on pricking or cutting the peduncles of the cerebellum, one may observe the phenomena analogous with those seen in the frogs. When the cerebellum is removed on both sides, there is no movement of rotation, but the animal dives deeply in the water. In an uninjured duck, the thorax extends in the water, for example, two or three inches; with a duck deprived of its cerebellum, it penetrates, on the contrary, from four to five inches. As for the frog, it appears as if the animal is heavier. If the injury is only on one side, it is that side which sinks most deeply in the water; at the same time the foot of that side is more perpendicular, the leg is more bent, and the neck is twisted.

In the duck, represented in Fig. 5, the left side of the cerebellum has been injured, and the animal has a movement of rotation toward the left side. According to our idea, these phenomena are due to an excitation of the centres of locomotion, and we think with M. Brown-Séquard that injuries of certain points of the brain produce a state of durable irri-

FIG. 5.



Duck in which the Cerebellar Peduncles have been divided.

tation, from which comes a tonic contraction of certain muscular groups, whether directly, or by a reflex action, and especially of the muscles of the thorax. It is very easy to be convinced of this influence of the muscles of the thorax, by making one's self the motions of swimming. This experiment, which is very easy, gives us proof at the same time, that simple paralysis, or want of function on one side, does not cause movements of rotation to take place. If we swim by one arm and one leg of the same side, there is no deviation, and we advance in a straight line; but, if the muscles of the thorax are made to contract on one side, we immediately incline in the water. If this contraction is increased, or entirely stopped, the body turns on one side, and at this time a motion of rolling occurs almost instinctively, which causes us, in a spasmodic manner, to take the normal position. It is very much the same thing as occurs to animals which have the motions of rolling. By injury of the brain, they are caused to lean greatly to one side, an attitude which they, moreover, have even when in repose; at the slightest movement they are thrown on their backs; immediately all the limbs are in action, and they endeavor to rise; but hardly is it accomplished than the animation of the injured side is reproduced, and, as there is already an adventitious quickness, this movement of uniformity exceeds the normal attitude, and again places the animal on the side and back; it immediately endeavors to replace itself on its limbs, rises, and again one side is excited, and so forth.

We have insisted on this fact; it is, that no animals can remain lying on the back, the cerebral lobes being removed. Always and forcibly do they endeavor to again take their normal attitude, and, consequently, from the time they are removed from this position, all their efforts are directed to maintaining their equilibrium on their limbs. It is at this time that the four limbs act in the same way, and it may be supposed that they all concur to the execution of the movement of gyration. But it is necessary to observe it well, and it is often quite visible, particularly in frogs, that there are two periods in the motion of rolling: the first entirely due to the muscles of the injured side, which causes the animal to incline, and turns it lightly over; the second due to the concurrence of all the limbs, which,

from the time the animal turns over, causes it to describe a half-circle, and endeavors to replace it in its forced and normal attitude. The first, especially when the injury is old, is rather slow, and less regular; the second is rapid and spasmodic. The former is the consequence of the injury, the latter of the regular functions of all the nervous centres; and, in order to explain this idea well, we will say that, in an animal from which we have only removed the cerebral lobes, a movement of rotation will be obtained, if, after the animal has risen, it is turned over on its back; the exterior force in this case replaces the action produced by the injury of the isthmus of the brain.

We believe we have shown that, in animals deprived of their cerebral lobes, the integrity of the movements is perfect, that it is due to the action of the centres of locomotion, which, when put in motion, is inevitable, and always the same after certain excitations; moreover, that in these conditions there is a forced and complete responsibility of the movements, and a necessity for the limbs all to concur to maintain the equilibrium; finally, that the movements of rotation are due to some disturbance in the equilibrium which exists between these different centres of locomotion.

ART. V.—*Theomania*. By ALLAN McLANE HAMILTON, M. D., one of the Attending Physicians at the New York State Hospital for Diseases of the Nervous System.

THERE are so few genuine cases of this disease that, when met, they should be studied with interest by the physician.

In nearly all varieties of insanity the subject of religion enters, at some time or other, as a basis of delusion or hallucination, but we rarely meet a case where religion *per se* is the original cause of the mental derangement. We would naturally suppose that clergymen were the victims, but such is not the case; it is among the minds of low order, the inhabitants of the country, and the attendants at "camp-meetings," "love-feasts," and "revivals," that the disease is most frequently seen. The large cities are comparatively exempt; there, other subjects craze instead of religion.

There are many patients brought to the asylums, with histories of theomania. Pale, sickly youths of bad habits, clergymen who have indulged in alcoholic excesses, and hysterical girls, with menstrual derangements—not one of these in a hundred is a true case of theomania.

This is certainly a very ancient form of insanity. "When man, dependent upon external influences, was passing alternately from happiness to sorrow, fear to hope, and from pain to pleasure, he very naturally reflected upon the relations of good and evil, prosperity and misery, and admitted the existence of two powers, a good and a bad one."¹ He believed in a divinity and a demon. These presided over his fortunes. A step more, and a system of theology was formed; but the predominance of unhappiness and trouble in the world induced a species of religious melancholy. In this state, certain devout ones worshipped the moon, and from *luna* received the name of *lunatics*.

The course of the stars governed the religious feelings of the world, and their periodicities strengthened religious belief. When Plato taught his doctrine of spirits, the complication of theological notions, nervous diseases, and particularly mental alienation, were considered sacred diseases, and due to the agency of spirits and demons. Many were tortured, and sacrificed, in a false, ignorant belief, to propitiate divine favor, and the fearful horrors of the stake tell a story of the intellectual perversion of the times, that is almost indescribable.

The complication of religious sects and fallacious beliefs made mental derangement common, till the beginning of the last century, and, since then, the occasional outcropping of a new set of *saints* has as often filled the asylums with theomaniacs.

The shadings and distinctions of religious insanity are as many as the causes that produce it. We may study the simple emotional derangement of the camp-meeting, fanaticism, or, finally, *theomania*, which is a branch of monomania.

Esquirol defines *theomania* as a subdivision of monomania, and says: "Among the monomaniacs, some believe

themselves to be gods; pretend to have communication with Heaven, and assure us that they have a divine mission, and present themselves as prophets and soothsayers."

The growth of this form of insanity is very clearly sketched by Dr. Pritchard: "A person who has long suffered under a sense of condemnation and abandonment, where all the springs of hope and comfort have appeared to be dried up, and nothing has been felt, for a long time, to invigorate the gloom and sorrow of the present time, and the dark and fearful anticipations of futurity, has passed all at once from one extreme to the other; his feelings have become of a sudden changed, he has a sense of lively joy in contemplating the designs of Providence toward him, amounting sometimes to rapture and ecstasy; such a change has been hailed by the relations of the individual thus affected, when they have happened to be pious and devout persons, as a happy transition from a state of religious destitution to one of acceptance and mental peace; but the strain of excitement is too high, the expressions of happiness too ecstatic to be long mistaken; signs of pride and haughtiness are betrayed, and of a violent and boisterous deportment, which are quite unlike the effects of a religious influence, and soon unfold the real nature of the case; or it is clearly displayed by the selfishness, the want of natural affection, the variableness of spirits, the irregular mental habits of the individual. In the cases to which I have now referred, there has been no erroneous fact impressed upon the understanding, no illusion, or belief of a particular message or sentence of condemnation or acceptance specifically revealed."

Forms of this disease take another type, i. e., when the outbursts are paroxysmal, and where the intellect is undisturbed upon other subjects. One case of this kind I have recently treated, and the symptoms were most certainly full of interest:

J. S., aged twenty-four, by occupation a school-teacher. In the latter part of August, 1871, this patient presented himself to me with the following history: He had been brought up in the country, and till two years of age was perfectly well. He then began to suffer from dyspepsia, characterized by

gastralgia, eructations and drowsiness after eating; with this there was a "fulness of the head," which lasted for several hours; he was constipated, and suffered with severe frontal headache. In the morning his extremities were cold, and he was irritable and nervous. His urine contained the phosphates in considerable amount, and his hands and feet were livid and rough. Toward night he was greatly troubled by vertigo and disordered vision; with this there was a rapid increase in temperature, which he declared amounted to a fever.

He found it impossible to fix his attention upon any thing, he became morose and irritable, with fits of uncontrollable violence.

His thoughts became more acute, imagination was heightened, while judgment and reason were blunted. At this time he took charge of a school, and was in the habit of holding animated religious discussions with the clergyman of the village.

He had purchased several books upon metaphysics, among which were some on spiritualism, and others devoting themselves to the scientific reasoning of religion, Rénan's "Life of Jesus" being one. The impaired physical state and the impending mental derangement needed some such spark to develop a settled insanity. At his first visit he presented a most distressing appearance. The other mental functions were so barely under the control of the will, that he indulged in occasional outbursts of unconstrained emotion; the least reference to the subject which had caused his mental distress (religion) would make him almost beside himself. His eyes would brighten, and his breathing become labored.

When shown the galvanic battery in my office, he would immediately go off into a rambling soliloquy and series of questions upon the connection between spiritualism and electricity. He stated that his heat of skin and mental trouble increased at night, and that his intellect was clearer in the morning, becoming more confused as the day advanced.

His intellectual ability was impaired in some ways; he continued the charge of his school, teaching some thirty children, and studying for this in his spare moments. His religious trouble seemed to be the only marked degeneration of intellect.

Upon the subject of his disease he was entirely unsettled. He imagined that those with whom he came in contact were "putting ideas in his head;" that there was a plot, in which all were implicated, to teach him a belief that would keep him from entering heaven.

At his second visit, a month afterward, he showed signs of persistent melancholia. He dwelt more upon his religious trouble, which seemed to absorb his entire attention; an old woman, who sat next to him in the waiting-room at the hospital, he imagined to be the devil in disguise, who was trying to tempt him. Almost every thing he associated with would suggest a religious train of thought. He was entirely "at sea" in his knowledge of the fundamental facts of religious belief. He knew that there was a heaven. He believed in spiritualism, and that all spirits were debarred from heaven till they had undergone a certain indefinite aerial existence.

Ophthalmoscopic examination revealed no change in the condition of the retina. He was very anæmic, consequently I prescribed for him a drachm of the solution Hammondi three times a day. In each teaspoonful he took one thirty-second of a grain of strychnia, and about two grains each of the pyrophosphate of iron and the sulphate of quinine. This medicine was given conjointly with the bromide of potassium, in doses of twenty grains thrice daily.

Since the last visit he made me, two months have elapsed without any marked change in his mental condition. His general appearance is better and his nerves more steady. His outbursts of excitement are not as frequent, but his intellect is as imperfect as ever.

There seems to have been in this patient a tendency to paroxysms, which does not belong to the variety usually quoted by writers, when melancholia is the principal feature of the disease. He had his lucid intervals, which were long, and then was perfectly sane upon other subjects.

Other forms of theomania are occasionally seen when the patients believe themselves damned, and this is the most common variety. The subjects of this kind of disease are of weak mind; they have good, pure hearts, but deep convic-

tions; they imagine they have sinned, and cannot escape punishment. They dread damnation, and convince themselves that they cannot escape hell.

They inflict penances upon themselves to do absolution, that will avert their final punishment. Esquirol says of this: "Persons who fear eternal damnation are indescribably miserable. Solely occupied by their sufferings and actual torments, imagination represents this state of anguish as the greatest of evils, as greater than death itself. The evils which they dread, but do not feel, necessarily produce less effect upon them than those which they endure. •Future ills can be but imaginary, while actual ones are realities. Their intolerable position is frightful and must be changed; not having the courage to suffer, how should they have to hope? All is despair. This state of things must cease, cost what it may. The surest way of effecting it is to cease to live. The resolution is taken, reason wanders—the future and the punishments of hell vanish. Delirium and despair direct the steel of the monomaniac, who usually ends his sufferings by self-murder.

Theomaniacs are the most cruel of all insane persons. Not only do they attempt their own destruction, but, after listening to a sermon, and believing themselves damned, they will go home and kill their children, to save them from the same doom they imagine to be their own.

The treatment of this type of mental disease is full of difficulties and obstacles. The general treatment usually followed in monomania is admissible here, but the mental treatment is hardly ever efficacious. Some writers speak of the influence of clerical advice, and do not agree that it is followed by any beneficial results. A case is related where this treatment was not followed by any permanent success. "A lady, believing herself damned, had recourse to several priests. A prelate, as reputable by his age as his virtues, went to her residence, arrayed in his pontifical robes, received her confession, and lavished upon her religious consolations. The patient recovered her reason perfectly for a few hours, but on the following day she relapsed into a state worse than her former one had been."

Zacutus¹ relates that he had restored to health a theoma-

¹ Quoted by Esquirol.

niac, by introducing into his chamber, during the night, an individual in the guise of an angel, who announced to the patient that God had pardoned him.

The aim, then, in the mental treatment is to obtain control over the mind, to gain the patient's confidence, and to combat delusions and passions by counter-passions.

We find that the cause of theomania is usually fear, and that the actions of the theomaniac are due to a false notion of religion, and a degenerate moral condition. One of the most fruitful causes of the disease is the large number of infidel works that fall too readily into the hands of the skeptical. The advance of spiritualism and other "*isms*," which unnaturally and wickedly excite and disturb the brain, is another evil. We find, lastly, some men who use the pulpit as a place for the purpose of painting hell in its most frightful colors. It is they who strive to produce an impression upon the mind of the weak hearer, who try to excite the imagination by perverted biblical facts and truths, and, finally, send him home to torture himself with the horrors and conflicting doubts that fill his unsettled mind. Like the steady dropping of water upon a stone, these weekly and daily repetitions of this maniac-making process will finally drive the patient to an insane asylum.

It was found, by Drs. Bucknill and Tuke,¹ that in 10,000 insane patients there is a percentage of 28.87 of ministers and clergymen; that, in 612 cases due to moral causes, 65 were deranged by religion. It was also found, as a moral cause, religious excitement ranked second, domestic difficulties heading the list.

The statistics of the Irish census for 1851 advance the fact that religious excitement made 55 patients insane; and Dr. Webster, in his statistics, reports that in 1,720 cases treated at the Bethlehem Hospital, of theomania, 29 were men and 50 women.

The statistics from our own country are very unsatisfactory. Nearly all the cases at the Bloomingdale Asylum, giving religious histories, were due to other causes.

¹ "Elements of Psychological Medicine."

CONTEMPORARY LITERATURE.

REVIEWS.

Spiritualism.¹

[Concluded from page 317, No. 2, April, 1872.]

WE now come to consider the phenomena of spirit-drawing, and here also we shall find that, as in the case of the painter Blake, between the genius of the spirits and their earthly interpreters with brush and pencil, there is a significant resemblance.

The pencil-sketches of Blake are redolent of the genius and spirit of the man and, although he believed as firmly that his famous drawing of the "Ghost of a Flea" was revealed to him by spirits in another world, as Mr. Thomas Skerratt and others that their drawings were the work of spirits, we must ask leave to differ from both, and assert our conviction that the phenomena were in each instance purely subjective; and that the drawings of Mr. Skerratt and others are the drawings of school-girls, and those of Blake, the drawings of a great, powerful, though insane genius, confirms us in this opinion. We think that no candid man can read carefully the life of Blake, and examine his drawings, and compare them with those made by art dabblers in spiritual *séances*, and come to any other conclusion.

Blake was confined for some time in Bethlehem Hospital as a madman, and here he was familiarly known as the Seer. He believed profoundly in the reality of his visions, he conversed with Michael Angelo, chattered with Moses and the prophets, and dined with Semiramis. There was nothing of the charlatan about him. He lived in the land of shadows. The gates of the New Jerusalem were thrown wide open before him, and he revelled in the glories of the celestial city. Whatever was sublime and awful, as well as beautiful, came up before him. His paper and crayons were constantly with him, that he might depict the spirits he saw, and who came before him for their portraits. He had large portfolios of his drawings, and among his portraits were those

¹ *Physics and Physiology of Spiritualism.* By W. A. Hammond, M. D. New York: D. Appleton & Co., 1871. *Spiritualism and Animal Magnetism.* By Prof. G. G. Zerffi. London: Robert Hardwick, 1871. *Spiritualism: a Narrative with a Discussion.* By Patrick Proctor Alexander, M. A. Edinburgh: Wm. P. Nimmo, 1871. *Report on Spiritualism of the Committee of the London Dialectical Society, together with the Evidence, oral and written, and a Selection from the Correspondence.* London: Longmans, Green, Reader & Dyer, 1871.

of the devil and his mother! "When I entered his cell," says the author of this relation (*British Review*, 1803, page 184), "he was drawing the spectre of a girl which had just appeared to him. Edward III. was one of his most assiduous visitors; in acknowledgment of the condescension of the monarch, he had painted his portrait in oil in three sittings. I questioned him in a manner intended to puzzle him, but his replies were *naïve* and unembarrassed in manner. 'Are these gentlemen announced? Do they send you their cards?' 'No, but I know them as soon as they appear; I did not expect Mark Antony last night, but I recognized the old Roman as soon as he entered.' 'At what hour do your illustrious guests visit you?' 'At one; sometimes their visits are long, sometimes short. I saw poor Job the day before yesterday, but he only stayed two minutes. I had scarcely time to make a sketch, which I afterward copied in *aquatinta*. But hush! here is Richard III.' 'Where do you see him?' 'Opposite you, on the other side of the table; it is his first visit.' 'How do you know his name?' 'My spirit recognizes him; I do not know how.' 'What countenance has he?' 'Harsh, but handsome; I only as yet see his profile. Now he is three-quarters; ah! now he turns toward me, and is terrible to look on.' 'Can you question him?' 'Certainly: what do you wish to ask?' 'If he can justify the murders he committed during his life?' 'Your question has already reached him. My soul holds converse with his by intuition and magnetism; we do not require words.' 'What is the reply of his majesty?' 'This, but in more words than he conveyed it to me. You would not understand the spirit language: He says that what you call murder and carnage is nothing; that to slaughter fifteen or twenty thousand men does them no harm; that the mortal part of the body is not only preserved, but passes into a better world, and that the murdered man who should reproach his assassin would be guilty of ingratitude, since the latter has only procured his entrance into a more perfect state of existence.' "The reader will recall the similarity of this to the spirit-utterance at a *séance* before alluded to.

We select the following illustration from the report of a *séance* held at the house of a Miss Nicholl, at which about two dozen persons were present. There were on the table two sheets of drawing-paper, a lead-pencil, a sable-hair pencil, some water, and a tube of water-color, madder-brown, some of which Miss Nicholl squeezed into a saucer. After the gas had been extinguished, they heard the sheets of paper (which from an accident had been drenched with water) being fluttered about the room. Presently one was brought to the hands of

one of the sitters, and they heard it patted for some time as if to dry it. The spirits then made one hold it up lengthways with the finger and thumb of each hand. They then heard the brush dipped in the saucer of color, and then applied to the paper, the movements being very rapid. The paper was laid, for a little while, flat on the table, and it was feared the moist color would be smeared; however, it was lifted up, and again worked upon. A light was then demanded, and a sketch of "the guardian angel" was displayed, which was still moist. "To my surprise," says one of the party, "I found that the drawing had been done on the side of the paper next to me, as if the spirit doing it had occupied my place or *been as it were within me*, so that, when laid on the table, it must have had the wet color upward, instead of running the risk of being spoiled, as I feared. There was but one color on the table, but a second was employed in the drawing, so that our spirit-friends must have themselves supplied it."

The next witness is Mr. Varley, the electrician, who states his skepticism respecting spiritual manifestations up to 1850. He also states that he thoroughly investigated the phenomena, and demonstrated that they were not the result of electrical forces, as no such forces could be evolved from the hands of uninsulated human beings, capable of moving a thousandth part of the weight of the tables moved. Mr. Varley also mentions the possession by himself of mesmeric healing power, of the nature of which we ask our readers to judge from his own statements which follow. Not being able to trace what he saw to electric forces or mesmeric influences, Mr. Varley, with many others, seems to have adopted the most ready, easy, and convenient solution of the problem, viz., the influence of spirits. We will not quarrel with Mr. Varley, or question his attainments in science; like many who have preceded him, when their "obstinate questionings" of natural laws have not been at once and satisfactorily answered, they have appealed to the supernatural. Natural developments are too slow for the class of scientists to which Mr. Varley belongs. But, as promised in the beginning, we allow Mr. Varley, like others, to speak for himself:

"I may mention," says he, "that I was possessed of mesmeric healing power. Three years after these experiments, I came to London, and made the acquaintance of the lady who has since become Mrs. Varley. She was subject to nervous headaches, and I got the consent of her parents to mesmerize her, with the view of effecting a cure. She was only temporarily relieved, and one day, while she was entranced on the couch, I was thinking whether I could permanently cure her. She answered my thought. I considered this very strange, and I asked her,

still mentally, whether she was answering my thought. She replied, 'Yes.' I then asked her whether there were any means by which a permanent cure could be effected. She replied, 'Yes; if you bring on the fit out of its usual course, you will disturb its harmony, and I shall be cured.' I did so—by the exercise of will—and, by bringing on the fits at intermediate periods, she was cured permanently. When entranced, she had a strong objection to being roused out of that state." These influences, Mr. Varley maintains, were exerted through both folding-doors and brick walls, the wall "being transparent to what passed from my hand or mind."

Those acquainted with the phenomena of cataleptic hysteria, and the strange hallucinations which sometimes accompany it, particularly in persons in ill health and of nervous excitable organizations, will readily understand the statements of Mr. Varley in reference to his wife; and if they will consult the writings of De Boismont, Abercrombie, and others, they will find such cases in scores: and, simply because they are obscure, we see no reason why they should be attributed to supernatural causes or spirits, on the same principle that eclipses were once attributed to the swallowing of the sun or moon by a great dragon. Science has already shown the fallacy of the one, and who will pretend to say how long it will be before it demonstrates the folly of the other?

"One night," continues Mr. Varley, "my wife addressed me in the third person, and said, 'If you are not careful, you will lose her.' I asked, 'Who?' She replied, 'Her, your wife.' I said, 'Who is now speaking?' The reply was, in substance: 'We are spirits, not one, but several. We can cure her, if you will observe what we tell you. Three ulcers will form on the chest. The first will break in ten days, at thirty-six minutes past five o'clock. It will be necessary that you have such and such remedies at hand. No one will be with you; their presence will excite her too much, and you must not inform her of these communications, for the shock would kill her.' On the tenth day I went home early. I had set my watch by Greenwich time. Exactly at 5.36, she screamed; that happened which had been predicted." And the ulcer subsequently broke at the precise time predicted by the spirits, and after this Mrs. Varley recovered her health, and became stout. All this, though curious and at present inexplicable by any positive known scientific law, was undoubtedly the result of natural causes operating upon two highly-sensitive nervous organizations; and, for much that is curious bearing on the subject, we would beg leave to refer the reader to the chapters on hallucinations in nightmare and

dreams; and on hallucinations in ecstasy, magnetism, and somnambulism, in De Boismont's great work already referred to.¹

The subjoined case of hallucinations in nightmare and dreams, affecting, by some occult sympathy, two individuals at the same time, is interesting as an addition to many of a similar character now on record. The scientists of the school to which Mr. Varley and others belong, attribute all such things to spiritual or supernatural influences acting from "within the veil" upon us mortals "in the flesh;" while the medical psychologist, possessing perhaps quite as much faith in "things *not seen* and eternal" as his spiritualistic brother, persists in attributing the phenomena to some ill-understood condition of the nerve-centres of the individuals affected—conditions which at some future time will be more fully elucidated by the slow, plodding, but sure advance of science. We see no reason why, in this controversy over an obscure subject, because the one persists in maintaining that, in this age of the world, all phenomena result from fixed causes, and natural though perhaps unknown laws, he should be called an infidel, or the other a fool because he stops scientific inquiry—"cuts the Gordian knot" by flying to the spiritual and supernatural for his explanation of things. As regards both, we are sometimes led to exclaim with Byron, in view of some of the poetry of his contemporary, Wordsworth, "I wish he would *explain his explanation*."

But, to come to the case in question—that of Mr. Varley's sister-in-law. This sister-in-law had heart-disease, and Mr. and Mrs. Varley visited her, as they supposed, for the last time. "I had," says Mr. Varley, "a nightmare, and could not move a muscle. While in this state I saw the spirit of my sister-in-law in the room. I knew that she was confined to her bedroom. She said, 'If you do not move, you will die;' but I could not move, and she said, 'If you submit yourself to me, I will frighten you, and you will then be able to move.' At first I objected, wishing to know more about her spirit-presence. When, at last, I had consented, my heart had ceased beating. I think at first her efforts to terrify me did not succeed; but when she suddenly exclaimed, 'O Cromwell, I am dying!' that frightened me exceedingly. and threw me out of the torpid state, and I awoke in the ordinary way. My shouting had aroused Mrs. Varley, who examined the door, and it was still locked and bolted. I told my wife what had happened, having noted the hour, 3.45 A. M., and cautioned her not to mention the matter to any one, but to hear what was her sister's version

¹ See "Rational History of Hallucinations," by A. Brierre de Boismont. Philadelphia, 1853, chapters xi., xii., *et seq.*

if she alluded to the subject. In the morning, she told us that she had passed a dreadful night; that she had been in our room, and greatly troubled on my account, and that I had been nearly dying. It was between half-past three and four A. M. when she saw I was in danger. She only succeeded in arousing me by exclaiming, 'O Cromwell, I am dying!' I appeared to her to be in a state which otherwise would have ended fatally. There is," says Mr. Varley, gravely, "one peculiarity in this case, which is, that *neither of us was dead!*" This peculiarity seems also to prove, to the satisfaction of Mr. Varley, that spirits need not necessarily be disembodied to be evoked, and that the "vasty deep," from which they are liable to be called, embraces this world as well as that which is to come. Neither dead nor living are safe, but all liable to be served with a spiritual bench-warrant from Mr. Varley or Mr. Home.

The evidence of Mr. Shorter differs in no essential particular from that of Mr. Varley, which it follows. The subjoined is his definition of spiritualism:

"Spiritualism is the recognition of man as a spiritual being, who, even while on earth, can, under certain conditions, hold communication with spirits who have left the mortal form. It is therefore concerned with all facts which tend to establish or confirm the belief in man's spiritual nature, and continued life after the death of the body. It embraces all studies which throw light on the nature, forces, and laws of the spiritual world, and its connection with the natural world, and on the interests, duties, and responsibilities of man, as a spiritual and immortal being, related to both worlds." This is all very well, if Mr. Shorter would cease to endow his spirits with material attributes, exhibit them in what would seem to be material forms, and communicate with them by material means and material organs. While he does this, there are those that will persist in believing that these spirits are the offspring of material causes operating in and through his own material organization—the excited or modified nerve and brain forces of himself and his *confrères* in this material world; and when, in answer to the question, "To what do you attribute these phenomena?" he answers, "I believe them to be caused by beings *substantial* but not *material*," and calls upon us to consult German philosophy in order to understand his meaning, we beg to be excused, and again, with Byron, call upon him to "explain his own explanation."

The testimony of Mr. Eyre bears witness, not only to the usual table-turning and piano-lifting operations of the spirits, but to another class of spiritual operations, viz., that of writing on the skin. A poor

woman of Waukegan, a village near Chicago, is spoken of as a "trance-speaking medium," and, while speaking under trance, she would hold out her arm, and with the forefinger of the other hand make a rapid motion as if writing, the movement of the finger being in the air, and about a foot from the arm; a few minutes after, and during the time she was still in trance, she stripped up her sleeve—a loose, hanging sleeve—and then, on her arm, so distinctly written that it could be read across the room, was the peculiar signature of the spirit giving the communication. A committee, consisting of the mayor, and some leading physicians and scientific men of Milwaukee, was appointed to investigate the matter. Mr. Seymour appeared before this learned body of men, but they could come to no conclusion touching the phenomena, and broke up without making a report.

That physical appearances, similar to those stated above, can be produced by individuals in trance, or laboring under the intense nervous excitement of ecstasy, seems to be a well-established fact. The ability of Marie de Moerl to produce, while going through in her own person the agonies of an imaginary crucifixion, the prints of the nails in her hands, and from which blood even would be seen to issue, appears to be well authenticated; and, before attributing all such phenomena to the influence of spirits, believers in spiritual manifestations would do well to study more carefully than they have hitherto done the extraordinary, indeed marvellous influence of the mind over the body under certain circumstances.

As the case of Marie de Moerl is very curiously illustrative of some of the phenomena attributed by spiritualists to supernatural causes, and moreover is, as we have said, so well authenticated, that no reasonable doubts can be entertained respecting the facts stated, we feel justified in bringing forward in this connection as condensed an abstract as is consistent with its continuity and the interest it has called forth. Moreover, it may be new to many of our readers. Marie de Moerl was born on the 16th of October, 1812, of a noble but reduced family. In her infancy she was subject to many severe nervous affections. At twenty, in 1832, her confessor noticed that sometimes she did not answer his questions, and that she appeared abstracted. The attendants of the young girl informed him that she was always affected in this manner when she received the communion. He promised to watch her closely. On the day of the *Fête Dieu*, he carried the Host to her early in the morning. She was instantly transported into an ecstasy. The next day, at three in the afternoon, he went to see her, and found her kneeling in the same spot where he had left her thirty-

• six hours previously. The persons about her, already accustomed to the sight, attested that she had remained in that position. The confessor undertook to prevent the recurrence of this state, which, he feared, might become habitual. To this end he inculcated the virtue of an obedience which the young girl had vowed on entering the third order of Saint-François. The ecstasies recurred, however, accompanied with phenomena more or less extraordinary, until toward the middle of the year 1833. At this time, a crowd of the curious, attracted by the voice of rumor, visited the ecstatic. It is calculated that forty thousand persons visited Kaldern between the months of July and September. Marie remained all this time in an ecstasy. The visits were forbidden by the authorities. The Prince-Bishop of Trent, desirous of knowing the truth, that he might communicate it to the government, came to the place. He declared that the malady of Marie did not in itself constitute a state of sanctity, but that her acknowledged piety was not a malady. The police, after this prudent declaration, interfered no more. In the autumn of the same year, her confessor perceived that the palms of the hands, where subsequently the marks of crucifixion appeared, sank in, as under the pressure of a body in half-relief. At the same time the part became painful and frequently cramped.

On the 2d of February, 1834, at the Feast of the Purification, he observed her wipe the middle of her hands with a towel, and exhibit a child-like alarm at the blood she perceived there. These marks soon showed themselves on her feet and on her heart. They were nearly round, spreading a little in length, three or four lines in diameter, and seeming to pass through both hands and both feet. On Thursday night and Friday all these wounds shed drops of blood, ordinarily clear. On other evenings they were covered with a crust of dried blood. Marie maintained the most profound silence on these wonderful facts; but, in 1834, the day of the visitation, the ecstasy came on during a procession, and surprised her in the presence of witnesses; she was seen twice absorbed in the most lively joy, her countenance flushed with a rose-like hue, and radiant with an angelic expression. She scarcely touched the bed with the point of her feet, her arms were extended, and all the attendants marked the prints on her hands. From that period this wonderful peculiarity could no longer remain a secret.

"The first time that I visited her," says the celebrated Dr. Goerres, "I found her in the position in which she remains during the greater part of the day, on her knees, at the foot of the bed, in ecstasy; her

hands were crossed on her breast, and showed the prints; her face was turned a little upward, and toward the church; her eyes were raised to heaven, expressing the most profound abstraction, which nothing external could disturb. During whole hours I was unable to detect any motion in her body, excepting that produced by an almost insensible respiration or a slight oscillation, and I can only compare her attitude to that in which angels are represented before the throne of God, absorbed in the contemplation of His glory. It will readily be imagined that this spectacle most vividly impressed the minds of all who witnessed it. According to the report of the *curé*, and other directors of her conscience, she has been in a constant ecstasy for four years. Most generally, the subject of meditation in the ecstatic is the passion of our Saviour, which produces on her the most profound impression, and is exhibited externally. Every Friday in the year, the contemplation of this mystery is renewed, and thus affords the opportunity of frequently watching its marvellous effects. The action commences on Friday morning. If the facts are followed up, it is observable that as certain persons speak their thoughts aloud, without being conscious of the words they are uttering, so Marie de Moerl reproduces the passion by meditation without knowing what she does. At first, the movements are soft and regular; but, in proportion as the action becomes more distressing and powerful, the image which she assumes takes a deeper and more distinct character. Finally, when the last hour approaches, and her heart is lacerated by grief, death is imaged on every feature. She is there on her knees, her hands crossed on her breast. A mournful silence reigns around, scarcely disturbed by the breathing of her attendants. Pale as her countenance may have appeared during this sorrowful drama, you observe her grow still paler; the shudder of death occurs more frequently, and life is gradually departing.

"Sighs, breathed with difficulty, announce that the oppression augments. Her eyes, more and more fixed and immovable, shed large drops of tears that fall slowly down her cheeks. Nervous spasms occur; involuntarily she opens her mouth; like a thunder-cloud pre-
saging a storm, these spasms form larger circles, until her whole countenance is distorted, and they finally become so violent that, from time to time, they shake her whole frame. Respiration, already so difficult, is changed into painful and plaintive sighs; a dull redness covers her cheeks; the swollen tongue seems to cleave to the palate; the convulsions become quicker and stronger; the hands, hitherto crossed, give way and fall rapidly; the nails assume a blue tinge, and the fingers are convulsively interlocked.

"Presently, the rattle is heard in the throat. The breath comes with more effort from the breast, which seems bound with thongs of iron; the features are so distorted as to be scarcely recognized; the mouth is wide open, the nose shrunken, the eyes are fixed, and seem as if ready to burst their orbits. At long intervals some sighs escape through the stiffening organs, and it would seem that the last must soon be uttered. The head then bows with every sign of death; and the whole appearance is totally unlike herself. All remains thus for the space of about a minute and a half. Then the head is raised, the hands return to the breast, the countenance recovers its form and calm expression; she is on her knees, absorbed in offering her thanksgiving to God. And this scene is renewed weekly, always the same in its essential phases, but more particularized in Holy Week, and each time showing the peculiar traits corresponding to the actual state of mind of the patient. I convinced myself of this by a careful examination on several occasions; for there is nothing studied, nothing false, nothing exaggerated in all this marvellous representation, which flows like anequeal stream; and, if Marie de Moerl actually died, her death could not appear more real.

"However absorbed in her contemplations the ecstatic may be, a single word from her confessor, or any person in spiritual connection with her, is sufficient to recall her to real life, without passing through any intermediate state. One instant suffices for her to recover, and she opens her eyes as though she had not been in ecstasy. The expression of her countenance instantly changes; it resembles that of a lively child who has preserved its simplicity and candor. The first thing she does on coming to herself is to hide her marked hands beneath the bedclothes, like a child that has inked its sleeves and hears the footstep of its mother. Then, being so accustomed to a concourse of strangers, she looks around and gives to each a friendly greeting. She exhibits great uneasiness when the emotions of those by whom she is surrounded, and which arise from witnessing her apparent sufferings, are too visible. When they are impressed with a feeling of veneration and solemnity, she endeavors, with a charming liveliness of manner, to efface the feeling. As she has long kept entire silence, she tries to make herself understood by signs; and when that fails, like a child who cannot yet speak, she looks to her confessor, and with her eyes begs him to answer for her.

"Her black eyes express the joy and ingenuousness of childhood. Her clear and expressive countenance at once forbids the idea that her heart can be the chamber of fraud or hypocrisy. There is no appear-

ance of gloom or of exaltation ; no weak or false sentimentality ; and still less of hypocrisy and pride. Her whole appearance conveys the impression of a serene and joyous childhood preserved in innocence, easily yielding to playfulness, because the pure and delicate tact which she possesses rejects all that might be unseemly. When with her friends, she can, once restored to herself, remain so for some time ; but it is evident that it is with a great effort, for the ecstasy has become her second nature, and the life of others is, to her, something artificial and unusual.

"In the midst of a conversation, in which she even appears to take pleasure, her eyes suddenly close, and without any transition she returns into her ecstasy. During my stay at Kaldern, she was requested to be godmother to a new-born child who was baptized in her chamber. She took it in her arms, and manifested the greatest interest in the whole ceremony ; but several times she fell back into ecstasy, and it was necessary to recall her to the reality of what was going on around her.

"The beholder is astonished at seeing Marie de Moerl pass from common to ecstatic life ; lying on her back, she seems to float on the waves of a luminous tide, and to throw a joyous look on all around. Suddenly she plunges gently into the abyss ; the waves play for an instant around her, they then cover her face, and you follow her with your eyes as she descends into the depths of the pellucid waters. From that moment the lively child has disappeared, and when, in the midst of her transfigured features, her dark eyes are opened to their full extent, and darting their rays into vacancy, she looks a very sibyl, but full of nobleness and pathetic dignity.

"It must not, however, be supposed that her contemplations and pious exercises prevent her from attending to domestic duties. From her bed she directs the household, the cares of which she formerly shared with a sister, but whom death had removed. She has enjoyed for several years a pension obtained for her by charitable persons ; and, as her wants are few, she devotes it to the education of her brothers and sisters. Daily, about two in the afternoon, her confessor recalls her to ordinary life, in order that she may attend to the affairs of the house. They then confer together on the subject ; she thinks of every thing, attends to the wants of those in whom she is interested, and, as she possesses good common-sense, every thing about her is well regulated."

As a fair specimen of the style of much of the testimony given in before the committee, we bring forward here the evidence of Mr. Low-

enthal, merely premising that such persons as he are perhaps more frequently met in the wards of a lunatic hospital than in hydropathic establishments; indeed, language and conduct nearly identical with those of Mr. Lowenthal have frequently been heard and seen by us in making the rounds of the wards of an asylum, and been considered a sufficient guarantee of the necessity for more prolonged treatment.

"On one occasion," says Mr. Lowenthal, "I entered a room in an hydropathic establishment, and a gentleman followed me, and I was compelled to walk up to him and speak to him. I immediately felt all sorts of ailments. I at once told him to sit down, and commenced walking round him, making all sorts of passes. I put a number of questions to him, and he told me he felt greatly better. All these actions," continues Mr. Lowenthal, "were involuntary, and were entirely spiritual. I did not make mesmeric passes at all, but my exertions were so great that persons thought I must fall down. I am frequently made to speak the language of another nation. I believe it to be an Indian language. My mouth utters sounds that I do not understand, and which have no meaning to me. I think it is the language of some North-American tribe. It is a soliloquy, and I get an impression on the brain, an idea that it means so and so. A voice *articulate, but not audible*, conveys a meaning to me. I have been among the Indians a good deal, and it sounds to me like their language." To us it sounds more insane than Indian, but we may be mistaken, having seen more of the former than the latter; but let Mr. Lowenthal be judged by our readers "out of his own mouth."

One of the committee, Mr. Sergeant Cox, suggested that the language may have been impressed on his mind; and Mr. Lowenthal continues: "Oh, not at all, I speak it with great fluency, but I cannot say I have ever spoken a language I have never heard.

"These communications convey information in the shape of impressions on the mind. I feel quite joyous while uttering them, as if under a pleasant influence. Sometimes information comes, but the idea always comes in my own language. The words my mouth utters come involuntarily. I have seen people of standing in society, and most refined, act in as free and unrestrained a manner as wild Indians in the woods, imitating the camp-life and the war-dance, and speaking in strange languages. This was done, I believe, *to take the starch out of them, so that they might receive spiritual knowledge!!*

"On one occasion, I was with a man who fell on my lap and addressed me in the most endearing language. When he recovered, he explained that I had given him great gratification in personifying his

dear sister, then in the spirit-world, who he was sure had controlled me at the time, to manifest her presence, and speak to him as though she were still here."

Those accustomed to the wards of an insane hospital will remark at once the similitude of this last performance to what is daily observed there. The insane are constantly mistaking strangers for their most intimate friends and acquaintances, who perhaps have long been dead. This man, whether insane or sane, evidently suffered an illusion of the senses, and, like many others, accounted for it in the easiest manner, by attributing it to a spiritual revelation.

Mr. Hockley, the next witness, spoke of the power of divination by means of the crystal; and his testimony is chiefly interesting as showing how much of the belief in the marvellous has come down to us from ancient times and the middle ages, and the mental calibre and scientific attainments of the individuals on whose report of their visions and morbid sensations we are expected to rely in forming an estimate of the so-called spiritual phenomena.

We almost fear to tax the patience of our readers by his superstitious statements about his "crystal in a silver ring," but venture on a few to illustrate what we have said above. Moreover, we wish to deal fairly with all, of whatsoever mental calibre, whose testimony has been gravely brought forward by a learned committee like that of the "London Dialectical Society." "This is a crystal encircled with a silver ring, as a proper crystal should be. It was formerly the custom to engrave the four names of God in Hebrew on this ring. I knew a lady who was an admirable seeress, and obtained some splendid answers by means of crystals. The person who has the power of seeing, notices first a kind of mist in the centre of the crystal, and then the message or answer appears in a kind of printed character. There was no hesitation, and she spoke it all off as though she was reading a book, and as soon as she had uttered the words she saw, they melted away, and fresh ones took their place. I have thirty volumes, containing upward of twelve thousand answers received in this way, which I keep carefully under lock and key. A crystal, if properly used, should be dedicated to a spirit.

"My books are locked up, and nobody can see them; and sometimes, if I repeat some previous question which has escaped my memory, I am referred to the book in which it has been previously answered. The seers are generally of the female sex, and it is impossible to tell by their personal appearance whether they have the gift or not. I once knew a seeress that weighed nineteen stone. The only way to

tell whether a person is a seer, is by trying. Two persons occasionally see the same thing at the same time. On one occasion a lady was looking into the crystal, and when the mist divided she saw her husband in conversation with a lady, a friend of hers; and then a boy made his appearance. A friend looked over her shoulder, as she had put it down to rest her eyes, and saw precisely the same thing. Although I have had a crystal since 1824, I have never seen any thing myself. My seeress was perfectly in a normal condition, and in full exercise of all her faculties, and used to give answers to metaphysical and other difficult questions, which she could not possibly understand. I have nearly one thousand volumes on occult sciences. I do not think it has any thing to do with mesmerism. I put a crystal in the hands of a spiritualist, and she became quite rigid, and I had to make a pass before she could see. Some ladies would look five minutes, and others fifteen, before they saw any thing; but, if it appeared to them foggy, it has merely to be developed. The words appear on the mirror the same as they do in a crystal. The girl sits in front, and you ask a question. The answer appears on the glass more in printing than writing, and, as she repeats the words, disappear. Only the girls see the writing on the mirror. Gentlemen come to me and say, 'I want to see my guardian spirit.' The girl sees and describes the appearance. It appears in the same form as in life. I have sometimes come in the mirror in spite of self, my double, I should call it—to my annoyance. She would say, 'You are in the glass now.' I would say, 'How am I dressed?' and she would reply, 'As you are now,' or 'As you were last week,' as the case might be; and then would follow a dialogue, my spirit or double talking to the seeress, while it has also been in the glass. White's 'Life of Swedenborg' embodies my views as to this."

A MEMBER: "This is surely something more than a double; there would be three. I do not understand this."

MR. HOCKLEY: "There is a great deal more in this than you can understand. I do not believe that I have two spirits, but one soul, a body and an atmospheric spirit apart from my body, and that my spirit is not in me now, but with my soul, and that it will form the covering of my soul in the future state, but that it may even now occasionally be visible to others. On one occasion a man appeared in the small crystal, with a book before him, and she saw it was splendidly done, but too small to read. I gave her a powerful reading-glass, and she could then read it, for the glass increased the size."

MR. SERGEANT COX: "Are you of opinion that this is in any way connected with spirits?"

Mr. HOCKLEY : "Yes."

Mr. SERGEANT COX : "You think the spirits appear in the glass."

Mr. HOCKLEY : "I have no means of telling whether the spirits are there. I believe it is a spiritual manifestation, because I receive answers to questions which the seeress could not fabricate."

Mr. SERGEANT COX : "Is there any evidence that the things seen are objective and not subjective?"

Mr. HOCKLEY : "Yes, the book I alluded to, which was too small to read; when I got the glass, the seeress could read it."

Mr. ATKINSON : "A book was seen; was it a real book, or do you suppose it was the spirit of the book in the glass?"

Mr. HOCKLEY : "Yes, I suppose it was; why shouldn't I believe there is a spirit to every thing? I believe that if I, or any human being, had forged a man's check and then burnt that check, it could have been seen by my seeress."

Mr. SERGEANT COX : "Supposing she had never heard any thing about it?"

Mr. HOCKLEY : "It would have been the same."

Mr. SERGEANT COX : "Do you think the spirit is in the glass, or in the mind of the seer?"

Mr. HOCKLEY : "I have no means of forming an opinion."

Mr. SERGEANT COX : "Then why do you believe that spirits have any thing to do with matter?"

Mr. HOCKLEY : "Because she speaks Hebrew and languages of which she knows nothing, and because, moreover, events that are taking place at the very hour can be brought up, and the circumstances of their occurrence accurately described."

Dr. EDMUNDS : "You believe it is spiritual, because nothing else will account for it; if I had a check in my pocket now, could a seer read it?"

Mr. HOCKLEY : "No."

Mr. ATKINSON : "It could be done."

Mr. HOCKLEY : "Cruikshank and others have had a wrangle about the spirits' clothes; did anybody read in Scripture of a spirit appearing without clothes? It is no good twisting words into fantastical notions, if you want to get at truth."

The next witness examined before the committee was Mr. D. D. Home, the "trance medium" *par excellence*, to whom we have previously referred. Before proceeding to give Mr. Home's testimony, we would call the special attention of our medical and particularly medico-psychological readers to what he says of his own physical and

mental health and constitutional tendencies, for it must be remarked that those special idiosyncrasies are the ones most peculiarly adapted to spiritual influences and manifestations; indeed, it must, we think, strike the most superficial observer, that the interdependence of spiritual manifestations and certain physical conditions is too marked for mere coincidence. But, as this matter is clearly set forth by Mr. Home in his evidence, we prefer to use his own language; in this way he and his spiritualistic followers cannot complain of misrepresentation, for, we repeat again, that our desire is to deal fairly with a subject which has caused so much commotion in both worlds—"the here and the hereafter."

In answer to the question of the chairman, "Can you state the condition under which manifestations take place?" Mr. Home said:

"You can never tell. I have frequently sat with persons, and no phenomena have occurred; but, when not expecting it, when in another room, or even sleeping in the house, the manifestation took place. I am, I may say, extremely nervous, and suffer much from ill-health. I am Scotch, and second sight was early developed in me. I am not imaginative; I am not skeptical, and doubt things that take place in my own presence. I try to forget all about these things, for the mind would become partly diseased if it were suffered to dwell on them. I therefore go to theatres and to concerts, for change of attention."

The CHAIRMAN: "Will you give us some information relative to external physical manifestations, such as the lifting of tables or persons? Do you go into a trance?"

Mr. HOME: "Certain things only occur when I am in a trance. But the trance is not necessary for all the phenomena; the only thing necessary is, that the people about should be harmonious. At times I have been awoke at night by a presence in the room, and then the spirits would dictate what was being done in another room. I wrote it down, and found it always correct."

Mr. BENNETT: "What are your sensations when in a trance?"

Mr. HOME: "I feel for two or three minutes in a dreamy state, then I become quite dizzy, and then I lose all consciousness. When I awake I find my feet and limbs cold, and it is difficult to restore the circulation. When told of what has taken place during the trance, it is quite unpleasant to me, and I ask those present not to tell me at once when I awake—I myself doubt what they tell me. I have no knowledge on my own part of what occurs during the trance. The harmonious feeling is simply that which you get on going into a room,

and finding all the people present such that you feel at home at once. Manifestations occur at all times, during a thunder-storm, when I am feverish or ill, or even suffering from hæmorrhage of the lungs. Skepticism is not a hinderance, but an unsympathetic person is. Sex has not any influence. As for mediums, they are generally very nervous. Since I was born, I was never expected to live; but I found the manifestations beneficial if not overdone. It is calming. At the age of six I was not able to walk. I have been given over by Dr. Louis, of Paris. The spirits told me I should get better. At the time of the lawsuit with Mrs. Lyon, I had congestion of the brain. I was paralyzed; my memory left me. They told me I would get well again, and I have done so."

Mr. ATKINSON asked witness the difference between manifestations in and out of trance.

Mr. HOME: "In a trance I see spirits connected with persons present. Those spirits take possession of me; my voice is like theirs. I have a particularly mobile face, as you may see, and I sometimes take a sort of identity with the spirits who are in communication through me. I attribute the mobility of my face, which is not natural, to the spirits. I am most frequently in the air when I am awake. When I am in a trance, I frequently take a live coal in my hand. I was skeptical on that point, and, on taking one in my hand when awake, I raised a blister. I have never been mesmerized, and cannot mesmerize. I have an exceedingly gentle way of approaching any one, whether well or ill, and they like to have me near them. I may say I am exceedingly sick after elongations. While in Paris I saw the figure of my brother, then in the North Sea. I saw his fingers and toes fall off. Six months afterward tidings came of his having been found dead on the ice, his fingers and toes having fallen off through the effects of scurvy."

Mr. COLEMAN: "Does Mr. Home remember any circumstance happening in the presence of Mrs. Trollope?"

Mr. HOME: "I stayed in Mrs. Trollope's house at Florence."

"Mr. COLEMAN: "No; I mean at Ealing?"

Mr. HOME: "I do not remember."

Mr. COLEMAN said he had read a letter from Mrs. Trollope, in which she said she received almost daily evidence of the presence of the spirits of her family, more particularly of her children. He also remembered seeing Mr. Home, while at his house, lifted from his seat, carried into an adjoining room, brought back again, and laid on the table. Mr. Home knew he was so, because he asked for a pencil and wrote on the ceiling.

Mr. HOME: "Yes, I recollect that perfectly. In the houses of

several people I remember constantly being lifted. On one occasion. I was staying at the *château* of M. Ducosse, the Minister of Marine. I was then lifted half a foot in the air. The movement was so gentle that I had not observed it in the least. I moved back from the table to see if it would occur when I was standing. It did occur. The room was longer than this, and I was carried to the end of the room. The Count de Bourmont, one of the senators, was staying there. I had evening-dress shoes on. He took hold of the shoes when I was in the air; they remained in his hand, and I was carried up. One Sunday evening Lord Adair was told to put flowers outside a window; we saw the flowers brought into the room where we were. The Master of Lindsay was present as well as Lord Adair. Instead of my body being lifted, the flowers were taken from one window to another. I do not remember being taken out at one window and in another, for I was unconscious, but numbers witnessed it. Once I was elongated eight inches. A man was standing, holding my feet. In one case I was laid on the floor, and Lord Adair had hold of my head, and the Master of Lindsay of my feet. The elongations were not confined to my legs, for I seemed to grow very much from my waist. I have seen a table lifted into the air with eight men standing on it, when there were only two or three other persons in the room. I have seen the window open and shut at a distance of seven or eight feet, and curtains drawn aside, and, in some cases, objects carried over our heads. In the house of Mr. and Mrs. S. C. Hall a table went up so high in the air that we could not touch it. I have seen a pencil lifted by a hand to a paper and write, in the presence of the Emperor Napoleon. We were in a large room, the Salon Louis Quinze. The empress sat here, the emperor there. The table was moved to an angle of more than forty-five degrees. Then a hand was seen to come. It was a very beautifully-formed hand. There were pencils on the table. It lifted, not the one next it, but one on the far side. We heard the sound of writing, and saw it writing on note-paper. The hand passed before me, and went to the emperor, and he kissed the hand. It went to the empress; she withdrew from its touch, and the hand followed her. The emperor said, 'Do not be frightened, kiss it;' and she then kissed it. It was disappearing. I said I would like to kiss it. The hand seemed to be like that of a person thinking, and as if it were saying, 'Shall I?' It came back to me, and I kissed it. The sensation of touch and pressure was that of a natural hand. It was as much a material hand seemingly as my hand is now. The writing was an autograph of the Emperor Napoleon, I. The hand was his hand, small

and beautiful as it is known to have been. In the house of Mr. Berghheim a smelling-bottle on the table began to tremble, as if some one with a very shaky hand had taken hold of it, and then it began to spin round on the table; it spun a minute at least. There were three witnesses who saw that. I went into a trance immediately afterward, and told them that a spirit named James was present. I learned afterward that Mr. James had a very shaky hand. The Emperor of Russia, as well as the Emperor Napoleon, have seen hands, and have taken hold of them, when they seemed to float away into thin air. I have never seen material substances brought into a room when the doors and windows were closed. Flowers have been brought in from a parterre, but the spirits always asked for the window to be open. When other witnesses were present they have seen heads. One witness will testify to having seen heads in her lap at night. They were luminous; there was quite a glow from them."

Mr. MEYERS: "Do you know of any communication from the Emperor Napoleon I. to the present emperor?"

Mr. HOME: "That I should decline to answer. The hand was like alabaster. I have not seen the hand from the box of the Davenport Brothers, and cannot say how these hands were formed."

Mr. JEFFERY asked if Mr. Home could give any information as to the state and condition of departed human beings.

Mr. HOME said that his information led him to the opinion that, precisely as we go to sleep here, so we awake in the other world. Wesleyans were Wesleyans, Swedenborgians were Swedenborgians, Mohammedans were Mohammedans. The spirit of a certain pacha who once appeared was strongly Mohammedan.

Mr. DYKE: "As to future rewards and punishments?"

Mr. HOME said that bad spirits see the continuous results of the wrong they have done, and in some cases have endeavored to repair it by declaring where concealed papers were. Spirits retained or showed special marks of indenture, scars, etc.

The CHAIRMAN: "Suppose a man dies after coming out of prison, will his hair still be what is vulgarly called 'cropped'?"

Mr. HOME: "I have never seen a jail-bird. But when the Henry Clay was burnt, in America, there was a case in point. I saw Jackson Downing standing before me with a deep scar on his forehead. I said, 'Jackson Downing is lost!' 'No,' said Dr. —, 'he is saved; he swam on shore with Mrs. Downing. Mrs. Downing was at the hotel, but she became uneasy when she found that her husband did not appear. She said she had seen him on shore after he swam with her.

It was then found that he had swum out again to assist some one, and a mast, falling overboard, split his skull, just as I saw it. The spirits obey a law of progress; some do not appear now that once did."

The CHAIRMAN: "Do they always retain a ghastly wound like that you first described?"

Mr. HOME: "No; it is merely shown as proof of indentity, just as the blue coat and brass buttons are shown in other cases."

Mr. GANNON: "Do you ever see the spirits of persons who are living? Mr. Varley speaks of such."

Mr. HOME: "No; that pertains to second sight, quite a distinct thing. Then, I see the individual himself, and not his spirit. A deadly tremor comes over me, and there is a film on my eyes, and I not only see persons, but hear conversations, taking place at a distance."

The CHAIRMAN: "Have spirits hair, and eyes, and noses, etc.?"

Mr. HOME: "Yes."

The CHAIRMAN: "Are the hair and eyes of the same material, if I may use the term?"

Mr. HOME: "I do not know; I never dissected them."

The CHAIRMAN: "Are the spirits male and female?"

Mr. HOME: "Yes."

The CHAIRMAN: "Have they passions and affections?"

Mr. HOME: "They have."

Mr. ROBERTS: "Have they children?"

Mr. HOME: "I think not."

Mr. BENNETT: "Is the human form the usual form of the spirits?"

Mr. HOME: "Yes."

Mr. LEVY: "Have you seen the spirit of a lower animal, the spirit of a dog, for instance?"

Mr. HOME: "No, but I have seen something which might have been, but I could not tell whether it was the result of imagination. In my opinion, there is another stage of animal life, but that is only a theory. I have seen birds."

The CHAIRMAN: "And fishes?"

Mr. HOME: "No, not fishes."

The CHAIRMAN: "Have you seen the apparition of an inanimate object, such as an inkstand?"

Mr. HOME: "No, the power is limited to living things. I have seen a flower—it disappeared."

The CHAIRMAN: "Then, if there be an apparition of a flower, may there be one of a coarser vegetable—a potato, for example?"

Mr. HOME: "I have not seen one. Now I recollect having seen a bottle appear. I think it was a water-bottle."

Mr. HOME said that spiritualism was either a gigantic imposture or a matter worthy of the deepest inquiry, and he hoped that the investigation would be conducted without any attempt to throw ridicule on the affair. As for himself, he gave readings for his living; he was only a poor man, and his only object was to place before the society the results of his experience.

We have brought forward this lengthy extract from the testimony of Mr. Home, in order to show our readers the views and claims of one of the most prominent, intelligent, and honest of the spiritualistic mediums. We are far from regarding him as an impostor, and are confident that he believes in the reality of his visions, sensations, elongations, and levitations. We also agree with him that the phenomena are worthy of the deepest inquiry.

The next witness examined was a Signor Damiani, and his testimony is still more extraordinary than any yet adduced. We will glance at a few of his statements. At a certain *séance* he says he received a spiritual communication from one that called herself his sister Marietta; he did not know that he ever had such a sister, but the spirit insisted that he had by repeated raps, and he was led to consult the family record. Here he discovered—what *he had never known before!*—that he had a sister born and baptized by a midwife as Marietta, and that the said infant sister died six hours after birth.

With regard to the signor's statement respecting the boy-medium and his twelve books of profound philosophy such as would be accepted from any accomplished writer of mature years, we would prefer to have the corroborative testimony of Father Gavazzi he offers, especially as to the *quality* of the philosophy, before accepting, without qualification, the somewhat sensational statement of Signor Damiani:

"I have been present at *séances*," says Signor Damiani, "when a sheet of blank paper and a pencil have been placed under the table; and a few seconds afterward, these things being picked up, sentences have been found written on the paper." The medium, the signor thinks, must have possessed extraordinary toes, to have written the lines with them; but, while we do not offer such hypothesis as an explanation, we can only say that some of the most excellent copies of old masters to be seen in the galleries of Antwerp, the artist painted with his toes, having no arms to work with.

The following statement of Signor Damiani as to the social condition of the spirit-world will be interesting to both aristocrats and democrats in this:

The signor said that he had learned from the spirits that there was

no distinction of rank in the other world. It was a regular republic—a democracy. “The longer we lived here the riper were we for the next, and after we left the body we begin to progress forever.” Bad men have to go through an atonement, suffering mentally, and repenting, but there was no physical suffering. The spirits were themselves studying the question of the Deity. In the next life painters will paint, sculptors will make statues. They would not fashion the spirit of marble, but (as he understood) spirit-marble. Here, again, we must exclaim with Byron, “I wish he would explain his explanation.” He had not seen spirit-horses, but he had heard of them. Dogs were immortal as well as men. No created form ever perished—not even trees.

In answer to a question as to the diet of spirits, and if there was even any thing like starvation among them, Signor Damiani said: “Every thing is so ordered that it is impossible, or it is not like the disorder here.” He further stated that he had had spirit-hands placed in his own, that these hands differed from our own by being cooler, and “beautifully pink and transparent.” A man, says he, is much more beautiful in the spirit. A lady whose teeth came out so horizontally that she could not close her lips, had them straightened in one night by the spirits, besides being rendered more beautiful in substance. The communication of the wicked spirit in regard to the death of Dr. Livingstone is interesting in many ways, particularly in view of the late *Herald* expedition in search of the missing explorer, and also as it illustrates the diabolical pranks these evil spirits will sometimes play on the credulous here below. Dr. Livingstone, let us premise, is supposed to have been dead some two years, when, at a *séance*, at Mrs. Marshall’s, Signor Damiani asked: “Is the spirit of Dr. Livingstone here?” A spirit answered promptly, “Yes, I am Dr. Livingstone.” The spirit of the doctor was then asked to relate all the particulars of his death—time, place, and circumstances. The answer to this request is a little amusing, and we give it in the signor’s own words, or rather those of the evil spirit itself, which said that “a native had crept up behind him, and given him a blow of a club on the back of the head and killed him *outright at once*,” and, continued the spirit, “the savages boiled the body and ate it.” When the spirit of the doctor was asked if he was not greatly horrified, whether in the body or out of the body, at being so served up by savages, the spirit replied: “No, for we must all be eaten!”

When it was ascertained that Dr. Livingstone was not killed at all, and the spirits were charged with falsehood, they entered into an explanation, which we also give in their own language: “You came here,” they said, “out of curiosity, and you found an impertinent

spirit who answered himself at your expense. It was simply the trick of a *ragamuffin* spirit."

Next, we have some strange testimony given in by a Mr. Glover. The spirit of Mr. Glover has much of the sulphurous odor of the middle ages; and had Mr. Glover lived in the times of the Salem witchcraft, and not burned some one for a witch, the reason probably would have been that some one had burned or hanged him first. Mr. Glover, like other spirits (or spiritualists) we have mentioned, kept an accordion, which it would seem was strictly devoted to high sacred spiritual song. "Once," says he, "when the air of the 'Last Rose of Summer' was being played," he said that he "thought the spirits ought not to play a *profane* air, and immediately a most magnificent *hymn-tune*, which he had never heard before, was played." Notwithstanding, Mr. Glover says he himself "once wrote a verse of a hymn to God," to the tune of "God save the Prince of Wales." This was, no doubt, in the estimation of Mr. Glover, a *sacred* melody, and every way suited to the *sacred character of the subject sung*.

Mr. Glover also, it would seem, was something of a dabbler in second adventism, for he tells us he "had made a study of the time of the coming of the Lord," and he was "informed that the Lord would come in August." Doubtless the "informer" in this instance was one of those "ragamuffin spirits" that told Signor Damiani about the clubbing and boiling of Dr. Livingstone!

Mr. Glover's spirits also pointed out to him illustrative texts of Scripture. He tells us that he once "made a cross in a circle, and asked, in the name of the Father, Son, and Holy Ghost, if the communications were of God, and the answer was 'No!' He then asked if they were of the devil, and the answer was 'Yes.'" He believes Satan did all this to deceive men.

Mr. Rowcroft, another witness, made the following statement with respect to apparitions: He said he once saw a form at the foot of his bed—a beautiful form—a spirit. When asked why he called it a spirit, he said he did so because he could think of it as nothing else; and no other person was in the room, and the door was locked. It was opaque, and could not be seen through. It remained about two minutes. Now, we regard this as a simple hallucination of the sense of sight; multitudes of such are on record, and the hallucination of sight is often accompanied by that of other senses, and indicates serious disturbance of the nerve-centres. Such hallucinations were very common among the insane, and by them are more frequently attributed to a real bodily presence than to any spiritual visitation; the causes

are the same ; and, though the spiritualist explains them in one way and the insane man in another, the medical psychologist of experience in these matters persists in attributing them to some ill-understood, perhaps, but deep-seated influences at work within on the nerve-centres. When an insane man tells us that he sees his wife and children being murdered on the lawn in front of his room, and is in great agitation at the sight, which to him has all the horrible force of reality, we do not tell him, with the spiritualist, that it is their spirits he sees, or seek to deny what is to him an awful reality, but to impress upon him, as far as his condition will admit, that it is all a result of his disease, and will disappear with the return of mental and physical health.

That much of this condition is mixed up with the phenomena of spiritualism we feel confident. A man need not necessarily be insane to suffer hallucinations, for this condition, as De Boismont has shown in one of his most interesting chapters, is quite consistent with reason. There is only this difference between the sane man who thus suffers, and the insane and the spiritualist: to the former they are subjective, and, like Nicolai and others, he knows they result from some disturbing cause acting from within ; to the latter they are objective and spiritual, the result, as he supposes, of causes operating on him from without, and quite independent of bodily conditions, which indeed are never taken into account. It is well known that a condition of somnambulism, catalepsy, ecstasy, or trance, can be induced artificially by some persons of peculiar nervous organizations in themselves and others, and how far hallucinations of the senses can, in such persons as Mr. Home and others, be brought about almost at will in himself and other susceptible persons with whom he comes in contact is, we conceive, a legitimate and interesting question for scientific investigation. It is only on this principle that we can at present account for the phenomena of levitation mentioned below ; for, to suppose that the positive and known laws of gravitation are to be even temporarily suspended for the accommodation of Mr. Home and his curious and susceptible observers, is too absurd to be entertained for a moment ; and to attribute the phenomena to spiritual influences is to shift over the difficulty to something still more obscure and incomprehensible, if not absurd. "I have seen Mr. Home's levitations," says Mr. Jones. "I saw him rise and float horizontally across the window. We all saw him clearly. He passed right across, just as a person might float upon the water. At my request, he was floated back again. The window-blinds were then moved up and down without any one touching them ; this seemed to be done to tone the light." All this is said to have taken place in the house of Mr. Milner Gibson.

The subjoined account of a special sitting with the Davenport brothers is very curious, and we here reproduce the statement of Mr. Jones for the edification of our readers, more particularly as the facts stated have been vouched for to the writer by other credible witnesses, who have been prompted by mere curiosity to hold sittings with them. Among those who confirmed the statements made below was the late distinguished and lamented pianist, as well as remarkable man, Louis M. Gottschalk. "I paid five guineas," says Mr. Jones, "to obtain a special sitting with the Davenports. I thought they were impostors, and did my best to discover the trick. We had a dark sitting. I helped to tie the young men, and I placed paper under their feet and marked the shape of the feet with a pencil. On the table was a pile of musical instruments. I had provided myself with some phosphorized oil, which I poured over them; my party then held hands. The oil flamed, and the instruments flew up and round the room; the light from the oil was sufficient for us to see all persons present. I asked mentally to be struck on the head, and was struck by a guitar very powerfully. So far as my experience went, I did not discover any imposture. The young men's feet had not stirred a hair's breadth." Insane patients will frequently complain of being struck and beaten over the head by spirits or imaginary beings of some kind, and point to the bruises which no one but themselves ever perceive; and, for aught we know, sane persons whose nervous systems are wrought upon by the strangeness of the circumstances, and excitement of a spiritual *séance*, may imagine things so vividly that they may seem to them as real as the bruising of the insane referred to. We do not assert that this is the case, but we certainly would sooner believe in its probability than the possibility of musical instruments, tables, and other inanimate objects flying about a room in the dark, without human agency, even though we should experience all this in our own person, suppose we saw the whole with our eyes, heard it with our ears, and even felt the knocks on our own pericrania. With regard to the elongations of the body of Mr. Home, we must be permitted to say the same. We believe, admitting the truthfulness of the statement of the Master of Lindsay respecting it, that it was more apparent than real; and, in spite of all their care, he suffered from deception or hallucination of the senses, for the one is possible, the other not only highly improbable, but absolutely impossible, and we believe our readers will agree with us when they read the statement. In answer to a question as to whether the elongations he had referred to in his paper were in the trunk or legs, the Master of Lindsay said: "The top

of the hip-bone and short ribs separate. In Mr. Home they are unusually close together. There was no separation of the vertebræ of the spine; nor were the elongations at all like those resulting from expanding the chest with air; the shoulders did not move. He looked as if he was pulled up by the neck; the muscles seemed in a state of tension. He stood firmly upright in the middle of the room, and, before the elongations commenced, I placed my foot on his instep. I will swear he never moved his heels from the ground. When Mr. Home was elongated against the wall, Lord Adair placed his foot on Mr. Home's instep, and I marked the place on the wall. I once saw him elongated horizontally on the ground. Lord Adair was present. Home seemed to grow at both ends, and pushed myself and Adair away."

Now, the mere tyro in anatomy must see that there could have been no real elongation of the body to the extent represented; that the spine itself must have elongated to admit of any marked separation between the hips and short ribs; and that the spine itself could not have elongated an inch without putting the spinal cord on the stretch, with consequences such as no spirit-surgeon or healing medicine could ever repair. It is hard to treat such statements as this and what follows seriously, and we could not under any other supposition as to the cause of the phenomena than that already given above. With regard to the levitations of Mr. Home, the Master of Lindsay makes the following strange statement. Our readers can form their own estimate of the statement, and have their own theories. We do not urge our own upon them:

"I have seen the levitations, but not in a brilliant light. Home on one occasion was sitting next me; in a few minutes, he said, 'Keep quiet, I am going up;' his foot then came and touched my shoulder; I then felt something like velvet touch my cheek, and, on looking up, was surprised to find that he had carried with him an arm-chair, pushing the pictures out of their places as he passed along the wall. They were far beyond the reach of a person standing on the ground. The light was sufficient to enable me to see clearly. I saw the levitations in Victoria Street, when Home floated out of the window. He first went into a trance, and walked about uneasily; he then went into the hall; while he was away, I heard a voice whisper in my ear, 'He will go out of one window and in another?' I was alarmed and shocked at the idea of so dangerous an experiment. I told the company what I had heard, and we then waited for Home's return. Shortly after he entered the room, I heard the window go up, but I could not see it,

for I sat with my back to it. I, however, saw his shadow on the opposite wall; he went out of the window in an horizontal position, and I saw him outside the other window (that in the next room) floating in the air. It was eighty-five feet from the ground. There was no balcony along the window, merely a strong course an inch and a half wide; each window had a small plant-stand, but there was no connection between them. I have no theory to explain these things. I have tried to find out how they are done, but the more I studied them, the more satisfied was I that they could not be explained by mere mechanical trick. I have had the fullest opportunity for investigation. I once saw Home, in *full light*, standing in the air seventeen inches from the ground."

The following is clearly one of those cases of hallucination of the senses, affecting two individuals at the same time, numbers of which are on record; and those of our readers who take sufficient interest in the subject should consult Brierre de Boismont's chapter on "Hallucinations," affecting a multitude of individuals at the same time, and under like circumstances:

"When I first saw Mr. Home," says the Master of Lindsay, "we had a *séance*. I was late for the train, and stayed the night with him; he gave me a shake-down in his room. There were no curtains to the windows, and the ground was covered with snow, the reflection from which made objects in the room distinctly visible. After I had been in bed twenty minutes I heard raps, and my pillow went up and down in a curious manner. That might have been the result of imagination. A few minutes after I saw an apparition which seemed like a column of vapor, or an indistinct shadow, which grew gradually into a definite shape, and I then saw the form of a woman standing *en profile* to me. She stood between me and Mr. Home. I saw the features plainly, and should have recognized them again anywhere. She seemed attired in a long, flowing gown, which hung without belt from the shoulders. The figure seemed quite solid—I could not see through it. I spoke to Home; he said he saw her distinctly, and that it was the apparition of his late wife; she often came to him. She moved and stood by his side. She then walked to the right side of the bed and rather behind it, but not out of my sight, and then slowly faded away like a column of vapor. The next morning I found an album, and, on looking over the pictures carelessly, I saw a photograph exactly like the figure I had seen. Mrs. Jencken said it was the likeness of the late Mrs. Home."

The answer of the Master of Lindsay to the question pro-

pounded by Dr. Edmunds, as to whether he had seen the apparitions of the lower animals or trees, explains fully his vision at the house of Mr. Home, and shows conclusively that the whole was dependent on physical conditions: "I was once," says he, "subject to a singular optical illusion. I used to see the spectre of a black dog. It seemed to glide along—I never saw it walking. I often went up to it and passed a stick through it. It was the result of overwork. I was at that time studying for the army, and *reading sixteen hours a day.*"

It would also seem that there was in the family of this witness an hereditary tendency to nervous disturbances, for he said that they were subject to "second sight," which he defined as "an intuitive knowledge of an event which is going on at the same moment in another place, and also of events which will happen." He brings forward the following example of this power: "A lady of my acquaintance married an officer of the army, who went out to India before the mutiny. One night in the drawing-room she screamed and fainted. On recovering, she said she saw her husband shot. The time was noted, and intelligence arrived that he had been shot, at the precise moment when she saw the vision. We suppose that, where one strong presentiment of this kind has been fulfilled, hundreds have not. Like vivid dreams, they are sometimes so fully realized that they seem almost prophetic, but most frequently, in the language of dreamers, they "prove contrary." It must be admitted, however, that there are many strange coincidences like the above on record. Swedenborg's prediction, or rather vision, at a distance, of the fire in Stockholm, which so greatly agitated him, as it raged in the same street in which was his own house, and his calming himself, when he "saw in his vision" of it, that the flames had been extinguished before reaching his own home, is well authenticated, as are many other strange things respecting this very strange man. For many curious illustrations of this, we again refer the reader to the treatise of De Boismont, a book which every one interested in the subject of spiritualism should not fail to peruse carefully; also the work of Mr. Dendy, on the "Philosophy of Magic" (London, 1841), and Abercrombie "On the Intellectual Powers" (London, 1841). The belief of Napoleon in *his star* is also a curious illustration of the disorder which sometimes seizes on great minds, powerfully overwrought in carrying out their mighty enterprises. We are confident that Napoleon so overwrought his great intellect that at times he suffered the consequences in the form of epileptic or cataleptic seizures. The following account of the star which appeared to him, on all great occasions, is authenticated by witnesses too credible

to be doubted. Moreover, we regard such visions as quite natural to such men, and that they even believe in them is, to us, no evidence of positive mental consciousness in the ordinary acceptation of the term: General Rapp, on his return from the siege of Dantzic, desiring to speak with the emperor, entered his cabinet unannounced. He found him in so deep a reverie that his entrance was unperceived. The general, finding him remain immovable, intentionally made a noise; Napoleon then recovered, and seizing Rapp by the arm said to him, pointing to the ceiling, "Look up there!" The general made no reply, but the question being repeated, he answered that he saw nothing. "What!" said the emperor, "do you not see it? It is my star; it is before you beaming;" and, growing more animated; he continued: "It has never deserted me. I see it on every great occasion; it urges me onward, and is an unfailing omen of success."

Ben Jonson, who had a tenacious memory and a brilliant imagination, occasionally experienced hallucinations. He told Drummond that he once passed a whole night in watching his great arm-chair, around which he saw Turks, Tartars, and Roman Catholics, rise up and fight, but he added that he knew these images to be the result of a heated imagination, and perhaps the "Red Mermaid wine," of which he speaks so enthusiastically, may have helped to heat his imagination.

Many examples might be cited in this place, did our space permit, of illustrious men who have had hallucinations of several of the senses. Malebranche declared that he distinctly heard the voice of God within him. Byron imagined that he was sometimes visited by a spectre, and though he was conscious that it was owing to the over-excitability of his brain, and said so to his friends, he was known to be superstitious, and even fearful of his spiritual visitants.

The account of the hallucination experienced by the celebrated Benvenuto Cellini, when imprisoned in Rome by order of the pope, is very interesting, and it is not hard to trace a resemblance between it and some of the statements we have brought forward from this report on spiritualism of the Dialectical Society: "One day," says Cellini, "having suffered so much from *ennui*, I resolved on suicide. I suspended with great effort an enormous beam over my head, but I was arrested and flung some paces from it in an invisible manner. I reflected on the cause that had prevented my destroying myself, and concluded that it was a divine interference. During the night, a young man of wonderful beauty appeared to me in a dream, and said, with a reproachful air: 'Thou knowest who gave thee life, and thou wouldst quit it before thy time.' I answered, it appears to me, that 'I ac-

knowledge all the gifts of God.' 'Why, then,' replied he, 'wouldst thou cancel them? Be resigned, and lose not thy hope in His divine goodness.'

"The governor was cruel. The invisible youth that had prevented my committing suicide came to me, and, in a clear voice, said: 'My dear Benvenuto, come, come, pray earnestly to God!' Terrified, I threw myself on my knees, and recited my usual orisons. The same voice said to me, 'Go to rest now, and fear not.'

"I frequently asked the invisible spirit who gave me such good advice, to let me see the sun, the object of all my dreams. On the 2d of October, 1539, I was still more earnest in my prayer. On the next morning, awaking an hour before daylight, and having dressed myself in an old coat that I had, for the weather was becoming cold, I began my orisons, and supplicated Jesus Christ to let me know, by inspiration, if I was considered unworthy to see the sun, for what fault I was subjected to so heavy a penance. I had scarcely finished, when I was carried, as if by a whirlwind, by my invisible spirit, into a room where he appeared to me under the semblance of a handsome young man, but whose whole appearance was austere. 'There,' said he, showing me a multitude of people, 'are all the men who have lived and died until now' (it will be remembered that Benvenuto was well versed in Dante); 'I prayed him to explain his motive for thus acting.' 'Come with me,' said he, 'and thou shalt see.'

"I had a short poniard in my hand, and wore my coat-of-mail. As I walked on, I saw in an immense hall men moving in crowds in every direction. Then the spirit having conducted me through a narrow gallery, I was suddenly disarmed. Bareheaded and dressed in a white robe, I walked on his right. I was in a state of admiration, mingled with surprise, for every place that I entered was new to me. I raised my eyes, and saw a wall on which the sun shone; but I saw not the sun himself. 'My friend,' said I to my guide, 'how can I be sufficiently raised to see the face of that planet?' He showed me a small ladder. 'Go up there,' said he. I went backward up the ladder. By degrees I began to see the sun, and, rising still higher, saw his entire globe. The strength of his rays caused me to lower my eyes; but I took courage, and, looking fixedly at it, exclaimed: 'O sun! whom I have so longed to see, I will contemplate but thee, even if thy fires blind me.'

"I stood, therefore, with a firm countenance; his rays soon spread to the right, and presently covered the whole globe, which caused me inexpressible admiration.

"What favor has God shown to me!' said I; 'what power exists in

his virtue!' The sun appeared a circle of the purest gold; suddenly I saw it increase, and from it came a Christ on a cross of the same material; he had an expression of goodness and grace that no pencil can paint. While I cried out, 'O miracle! miracle! with what happiness am I this morning filled!' Christ moved toward the side whence the rays had emerged, which parted us at first; and there issued a beautiful virgin, holding her son in her arms, and bestowing upon me the sweetest smile. Two angels were by her side, and a pontiff knelt before her. All these wonderful objects were clearly and vividly displayed, and I loudly and unceasingly praised God. When I had enjoyed this marvellous sight during half a quarter of an hour, I was suddenly retransported to my prison, where I continued giving thanks to the Most High, saying, 'God had at length made me worthy to see what no mortal ever saw before.'"

Pope suffered much from intestinal derangements, and one day asked his physician what arm that was that appeared to come out from the ceiling. The great Goethe asserts that he once saw the counterpart of himself coming toward him. The German psychologists give the name of *Deuteroscopic* to this kind of illusion.

Oliver Cromwell was stretched, fatigued and sleepless, on his bed. Suddenly the curtains opened,* and a woman of gigantic size appeared, and told him that he would be the greatest man in England. The Puritan faith and the ambition of Cromwell might have suggested, during those troublous times of the kingdom, some still stronger idea; and who can say whether, had the phantom murmured these words in his ear, "Thou wilt one day be king!" the protector would have refused the crown, as did Cæsar at the Lupercalian feast?¹

Similar to Napoleon's hallucination of the star is that recorded of Lord Castlereagh, who afterward, it will be remembered, committed suicide. His lordship was sojourning in an old castle in the north of Ireland, and one night, having retired to bed, put out his light, and dismissed his valet, he saw a ray of light at the head of his bed. He was convinced that there was no light in the room, or fire in the grate, and the curtains were closed; and, as the room had been totally dark a moment previous, he naturally supposed some person had entered the room. Turning quickly toward the point whence the light proceeded, he saw to his great astonishment the figure of a beautiful child, surrounded with a halo, which stood at some distance from his bed.

Convinced that he was perfectly in his senses, but suspecting a trick on the part of some of the numerous hosts of the castle, Lord

¹ Dendy, *op. cit.*, p. 41.

Castlereagh approached the apparition, which retired as he advanced, until, reaching the immense arch of the chimney, it vanished into the earth. His lordship returned to his bed, but slept not that night, so disturbed was he by the extraordinary occurrence. Was it real, or must he look on it as the result of an excited imagination? The mystery was not easily solved.

He resolved to make no allusion to the affair until he had carefully watched the countenances of all the inmates of the house, in order to discover if he had been made the victim of a trick. During breakfast, the marquis vainly endeavored to detect some of those covert smiles, look of connivance, or sly winks, that generally betray the authors of a domestic conspiracy. The conversation flowed as usual; it was lively; nothing bore the stamp of mystery; all passed on as usual. At length the hero of this adventure could no longer resist the desire he felt to relate what he had seen: he entered into all the particulars of the apparition. The recital aroused great interest among the auditors, and gave rise to a variety of explanations. The master of the house interrupted the divers comments, by observing that doubtless his lordship's relation had appeared very extraordinary to those who had only recently inhabited the castle, and were unacquainted with the family legends. Then turning toward Lord Castlereagh: "You have seen the *radiant child*," said he; "be satisfied; it is the presage of high honors; but I would rather that nothing had been said of the apparition."

On another occasion, Lord Castlereagh saw the "radiant child" in the House of Commons. It is very probable that on the day of his suicide he had a similar apparition.

There are many cases recorded in history of illusions and hallucinations, affecting a number, indeed a multitude, of individuals at the same time, and as these bear, we think, very intimately on the subject of spiritualism and its visions and revelations, and moreover are in themselves interesting, we here bring forward some of the best-authenticated, to show that all the phenomena of modern spiritualism have been known from the most remote times. Illusions of sight as well as of hearing have often assumed the form of an epidemic. Much of this is explained now by our knowledge of optical and other physical phenomena, little or not at all understood in remote times, when all sorts of figures were seen in the clouds, and armies of men and horses engaged in deadly conflict.

Thus, in the time of Charlemagne, phalanxes of sorcerers were seen fighting in the air. Afterward they were fantastic beings shouting in the temples; sublime solitary voices heard, as in the first ages

of the world.¹ In the reign of Charles VI, battles appeared to be going on in the skies at different times. Armed knights encountered one another, and the sky was the color of blood.²

At the battle of Plataea the air resounded with a fearful cry which the Athenians attributed to the god Pan; the Persians were so alarmed that they fled. This is said to be the origin of the term *panic-fear*.

Pausanias relates in his *Attics* that four hundred years after the battle of Marathon the neighing of horses and the shock of armies were nightly heard on the spot. All the curious did not hear it, any more than all the patient attendants at a spiritual *séance* are gratified at hearing or seeing what is expected, but it is said that those who travelled the plain unpremeditated often heard it distinctly.

Pliny informs us that, during the war of the Romans against the Cimbrians, on various occasions they were alarmed by the sound of trumpets and clashing of arms which seemed to all to come from the sky.

Plutarch, in his life of Coriolanus, states that, in the fight against Tarquin, Castor and Pollux were seen on white horses fighting valiantly in front of the battle. Appian speaks of the cries of men in terror, of the clash of arms, and the tread of horses.

The following is related by Josephus in his "Wars of the Jews" against the Romans, liv. vi., chapter xxi. :

"Shortly before the feast of Easter, on the 27th of May, an event happened that I should fear to repeat, lest it might be considered fabulous were it not that persons are still living who witnessed it; and the misfortunes that followed confirmed its truth. Before sunrise there appeared in the air, throughout the whole country, chariots full of armed men traversing the clouds and spreading round the cities as if to enclose them.

"On the day of Pentecost the priests, being at night in the inner temple to celebrate divine service, heard a noise and afterward a voice that repeated several times, '*Let us go out from hence.*'"

Similar facts are also cited from Josephus by M. Calmeil. Antiochus was preparing to carry the war the second time into Egypt. In the sky appeared men dressed in cloth of gold, armed with lances, galloping like squadrons about to charge, and even their naked swords, casques, bucklers, and lances, were distinctly visible.

Michaud, in his "History of the Crusades," says that, at the battle

¹ Ferdinand Denis, "La Monde enchanté."

² "Chronique des Religieux de St. Denis. Collection des Mémoires relatifs à l'Histoire de France."

of Antioch, in the thickest of the fight, the crusaders saw St. George, St. Theodorus, and St. Demetrius, come to their aid.

Now, if we are asked how such a number of men could become affected in the same way and at the same time, we would say (and the remark also applies to those in spiritual *séance*), that much of it is owing to sympathy, and the contagious influence of example, and disease, and excitement of the nervous system must also be taken into consideration. When the cry of fire is received in a large assembly how many are able to keep cool and take a careful survey of the situation?

When one individual, who imagines he sees supernatural appearances, hastens to impart his visions to others, and earnestly strives to impress them on those about him as superstitious, perhaps, as himself, he is readily believed, and his companions soon come to see exactly what he sees himself. The story of the man who exclaimed, while looking on a statue, that it bowed its head, is well known. All present affirmed that they saw the same extraordinary phenomena. The age of miracles may have passed, but that of wonder, self-deception, and superstitious credulity, has not, and from present indications is not likely to, till the coming of the millennium, or the time, if that ever arrives, when we shall have a perfect system of science and natural law by which every phenomenon in the material world can be explained as perfectly as is now an eclipse of the sun or moon. As long, however, as phenomena are in advance of their explanation by any such law, there will be, as in all ages of the world, those that fly to the supernatural for an explanation, and these phenomena of "spirit-rappings," "table-turnings," and all kinds of hallucinations and illusions of each and every sense, form no exception to this law.

Austie on Neuralgia.

THIS book¹ has been expected during several years, and has at last appeared. The author by the delay has gained greater experience, and therefore the work is more valuable. Certainly, some of his views are better expressed. There is so much difference between the article on neuralgia in "Reynolds's System of Medicine," and this book, that the latter might be considered a new work. Neuralgia is such a frequent complaint that any contribution to medical literature which may add to our knowledge of the affection, and of the nature of the changes in the nervous system leading to it, is cordially welcomed.

¹ "Neuralgia and the Diseases which resemble it." By F. E. Austie, M. D. (London) New York: D. Appleton & Co., 1872, pages 362.

Dr. Anstie thus sums up a few general considerations in regard to pain: "1. Pain it not a true hyperæsthesia; on the contrary, it involves a lowering of true function. 2. Pain is due to a perturbation of nerve-force, originating in dynamic disturbance, either within or without the nervous system. 3. The susceptibility to this perturbation is great in proportion to the physical imperfection of the nervous tissue, *until* this imperfection reaches to the extent of cutting off nervous communications (paralysis.)"

The classification of neuralgias is the same as in his previous article, but the descriptions are much fuller and more satisfactory. The classification is made under two systems: (a) according to the constitutional state of the patient; (b) according to the situation of the affected nerves. The first includes neuralgias from shock, from direct violence, either entirely or partially dividing a nerve, then from malarious origin, at various periods of bodily development, and from anæmia and mal-nutrition. The second variety, including those named according to the situation of the affected nerve, are essentially the same as the division made by Valleix, and also visceral neuralgias.

The descriptions of the various neuralgias are carefully drawn and very complete. We will only quote here and there a sentence relating to some of the slighter signs and peculiarities, without trying to give an outline of the description.

"In the greater number of instances, so far as my experience goes, it is the fifth cranial nerve which becomes neuralgic from the effects of central shock."

Neuralgia from malarial poisoning he considers very rare.

"It is rare to meet in young children with well-defined *unilateral* neuralgia, except from some special cause. Such neuralgias as do occur are commonly *bilateral*, and are connected either with the fifth cranial or the occipital nerves. . . . The period of declining life is preëminently the time for *severe and intractable* neuralgias. Comparatively few patients are ever permanently cured who are first attacked with neuralgia after they have entered upon what may be termed the degenerative period of existence." "In speaking of trifacial neuralgia during this degenerative stage, he says: "I regard a well-developed and typical neuralgia of the type we are now speaking of as an affection in which the mental centres are almost as deeply involved as in the fifth nerve itself; though whether this is an original part of the disease, or a mere reflex effect of the affection of the trigeminal nerve, I am not prepared to say."

In regard to the supposed rheumatic origin of certain neuralgias, he

remarks: "Indeed, upon this point, I think it is time that a decided opinion should be expressed. I firmly believe that a large number of sciatic patients have their health ruined by treatment directed to a supposed rheumatic taint which is purely imaginary."

The *points douloureux* of Valleix he considers to be a symptom of old neuralgia, that they are not found in recent cases, but instead, perhaps, a general tenderness of the surface. Hemisrania, he thinks, is a neuralgia, and states that it may occur in youth, and later in life be succeeded by undoubted neuralgia affecting the same parts.

Angina pectoris, or cardiac neuralgia, is treated of separately; the cause is thought to be central, and the condition of the heart one of relaxation, passing by reflex agency into a condition of spasm, which is often the cause of the severe and fatal attacks.

The chapter on complications is very instructive. "First, and on the whole, probably, the most common of all secondary affections, we may rank some degree of vaso-motor paralysis." The *points douloureux* are referred to this origin, "and the more widely-diffused soreness, such as remains in the scalp, for instance, after attacks of pain, even at an earlier stage of trigeminal neuralgia than that in which permanently tender points are formed, is, probably, entirely due to a temporary skin-congestion." We cannot agree with this last proposition, and we think that the view he takes of the central origin of neuralgia leads more naturally to the supposition that the soreness is likewise of central origin, that it is due to an abnormal irritability, and to the fact that the nerves have not yet recovered their usual tone, that is, they are still exhausted by the extra strain which has been imposed upon them by the attack of severe pain.

That the painful points may be the result of secondary changes in the nutrition of the parts, resulting in a thickening of tissues, we are ready to admit, but this is a very different thing from the diffused soreness. Among other nutritive changes, he mentions variations in the color, size and texture of the hair; thickening of periosteum and fibrous fasciæ in the neighborhood of the painful points; a certain coarseness of texture of the skin; the distribution of a greater or less amount of dark pigment to the skin near the painful part; increase of the epithelium of mucous membrane; herpes zoster, erysipelas, iritis, glaucoma, paralyzes of muscles, convulsive actions of muscles, impairment of common and special sensation; increased, sometimes diminished secretion. "The result of my experience is, that neuralgia, unless very slight and brief, is *never* unattended by these complications, and in the great majority of cases involves several different secondary alterations."

The chapter on pathology and etiology is a very interesting discussion of his views, as more briefly explained in his former article. While not accepting these views entirely, we must acknowledge that he has brought together a number of facts, each of which is of but little importance, but which taken together show the probability of the central origin of neuralgia. At the commencement, he says: "I expect, in short, to convince most readers that the essential seat of every true neuralgia is the *posterior root of the spinal nerve in which the pain is felt*, and that the essential condition of the tissue of that nerve-root is *atrophy, which is usually non-inflammatory in origin*." The portion which he has italicized we cannot admit has been proved.

No autopsy is given to prove his points; the case of Romberg is not given in full; we can see no reason for selecting for quotation only one item in the post-mortem appearances, though that affected the nerve especially implicated. There was the atrophy of the convolutions, frequently found among the aged; the arachnoid at the base was opaque, the arteries morbidly changed. The right vertebral was atrophied, the left was thickened and larger than usual; the basilar had several dilations at which the coats were thickened. The left carotid was dilated at its point of division, and its posterior half of treble the ordinary thickness, from conversion of the fibrous membrane into cartilage. The pons Varolii was soft and flaccid, the right side atrophied, the left half did not present the normal elevations. "The trigeminus of the left side was only half the ordinary thickness—slightly reddened, presenting one spot of a dark red; no filamentous structure was to be found in it, the nerve being almost reduced to a pulp. The smaller division of the nerve, which was also softened and attenuated, was only to be distinguished at the inner side of the nerve, at a distance of six lines from the pons. . . . The portions of the fifth pair left in the cranium, from the point of division to the point at which they entered into the fissure of the dura mater, also presented an unusual diminution of bulk and a slightly reddish-yellow tinge of the nerves; their filamentous structure became more apparent the nearer they were examined to their termination." An incision was made through the crura ad cerebellum and pons, so as to trace the fibres of the fifth nerve. The gray matter of the pons was diminished on the left, normal on the right, though externally more reddened by numerous distinct blood-vessels. "The sectional surface of the left crus ad cerebellum presented a great number of delicate red spots of blood, which caused the white tract of the trigeminus to be the more apparent. At its external side, about a line and a half from the so-called origin of the left trigeminus, the medul-

lary matter of the crus was rather reddened and softened, and contained an irregularly quadrilateral, hard corpuscle of the size of half a lentil, yellow, of a grayish translucency in the middle, and exhibiting increased density and hardness on examination with the scalpel. The right crus was normal, and the filamentous structure at the origin of the right trigeminus was more distinct than on the left side."

"Both Casserian ganglia and their three branches, the first two of which were examined as far as the orbit on both sides, presented no abnormal appearance, except that the ganglia were rather paler than usual. . . . On opening the cavernous sinuses from above, the right carotid appeared normal, if we except a few points of cartilaginous deposit; but the left internal carotid was distended to double its ordinary calibre, so as to form an aneurism both in its anterior and posterior arch. The walls of these aneurisms were cartilaginous and much thickened." The bone was somewhat changed, and the left half of the pituitary gland converted into a purplish-brown liquid. "As the ganglion Casseri lay between the plates of the dura mater, at the external side of the aneurism, it was necessarily exposed to pressure from it, the more so as the base of the brain showed no change of position in the external wall of the left cavernous sinus, and therefore the Casserian ganglion was bound down to the side of the body of the sphenoid bone by the tense dura mater." Among his remarks about this case, Romberg says: "The fifth nerve of the suffering side was affected in different ways at two points. In the first place, it was softened and had lost its filamentous structure at the point where it leaves the pons Varolii; the softening of its fasciculi was perceptible, even within the brain, in its passage through the pons and through the crura ad cerebellum, and an indurated node was found within them. In the second place, the Casserian ganglion, *though normal in structure*, was subjected to tension and dragging by the aneurismatic swelling of the carotid and its pulsations." He thinks that, from the long duration of the disease, its slow progress, and the absence of anæsthesia, the irritation of the ganglion had the precedence, in point of time, as the cause of the neuralgia.¹

It is impossible, in view of all the facts in this case, to attach the importance to it which Dr. Anstie has as proof of his proposition. An autopsy made thirty-six hours after death finds an atrophy of brain and right side of pons, extensive disease of arteries, a tumor in the course of the fifth nerve within the pons, an aneurismal swelling press-

¹ Romberg, "A Manual of the Nervous Diseases of Man." Sydenham Society, vol. I., p. 87, *et seq.*

ing on the nerve or its ganglion, a certain amount of softening, which was probably partly cadaveric, for the pons and the right trigeminal were also softer than usual, and diminution in size. The ganglion was not, however, "almost destroyed;" it was *normal*. Of course the remarks in regard to the "acutest agonies of neuralgia being felt in a nerve, the central end of which is reduced to such a pitch of degeneration that conduction between centre and periphery must very shortly have entirely ceased, had the patient lived," and the illustration of Waller's experiments, are superfluous; for the nerve was not destroyed, there was no anæsthesia, if any change, increase of sensitiveness to the prick of a pin. Indeed, we cannot see that this case differs from multitudes where tumors within the cranium or along the course of nerves give rise to severe pain. Surely this is not neuralgia, as Dr. Anstie defines the disease.

The statements in regard to the position of neuralgia as an hereditary neurosis are very interesting, and conclusive that there is a tendency, in those whose ancestors have been affected with nervous disease, to have neuralgia. We do not think that causation from such a tendency by phthisis is established. How can hereditary tendency prove even the central origin of neuralgia, much less that it is due to atrophy of the posterior roots? So, too, what is said in regard to the influence of misdirected education, though excellent, does not advance his cause. The influence of cold, of wounds, of tumors, of reflex influence from various organs, of mal-nutrition, rheumatic and other diatheses, of degenerative changes in vessels, etc., do not alone or together prove that it is probable that the posterior roots are atrophied.

Certain statements made by Dr. Anstie would lead us to question whether so serious a change is the cause of neuralgia in the first instance. He says that hereditary character is shown "by the facts respecting the *alternations of neuralgia with other neuroses in the same individuals*. . . . The first and most essential characteristic of a true neuralgia is, that the pain is invariably either frankly intermittent, or at least fluctuates greatly in severity." The relief afforded by the injection of morphia continues sometimes for many days, or it may be that the injection produces a speedy cure. "*The habit of long neuralgic paroxysms should not be set up*; and if the first two or three attacks are promptly stopped by the induction of sound, non-narcotic sleep, we may get time so to modify the constitution as to eradicate the neuralgic disposition, or at least reduce it to a minimum."

One would not expect such fluctuations and such speedy relief if the primary lesion of neuralgia were atrophy of nerve-roots.

His argument drawn from locomotor ataxy, in which the neuralgic pains are found, and in which there may be atrophy of posterior roots found after death, does not seem to us to have the weight which he attaches to it. The pains in the legs are among the earlier symptoms of the affection; the atrophy is the ultimate lesion found after the disease has run a long course, and may be wanting. The two are separated by the whole course of the disease, it may be twenty years or more.

We will allow that atrophy might be found as a final result of secondary changes set up in the posterior roots, as thickening of the tissues around the tender points is the result of secondary changes.

The argument in proof of the atrophic nature of the lesion in neuralgia fails. The facts brought to support it do, however, convince us that previous ill-defined impressions of its central origin are probably correct. We admit that hereditary taint, the influence of education, cold, wounds, and tumors of or near nerves, mal-nutrition, etc., are more likely to weaken the central nervous system, and place it in a condition to give rise to neuralgia upon a slight additional strain or irritation. We are the more ready to grant this as recent investigations show that tetanus may be caused by an injured nerve acting upon the nutrition of the cord, and exciting inflammation, the nerves being intact, also that injuries to nerves may lead to softening of extensive portions of the cord, the nerve also being intact.

In referring to the causation of complications, Dr. Anstie well says: "In the present state of our information, I am inclined to explain all the congestive complications of trigeminal neuralgia on the basis of vaso-motor paralysis. And I further believe that the cause of that paralysis is a direct extension of the original morbid process from the sensory root to the motor, affecting the origin of fibres in the latter, which are destined to govern the calibre of ocular and facial vessels. . . . There must be more than this, however, to account for the whole of the *trophic* phenomenon." He believes in the existence of trophic nerves which are implicated.

The complication of neuralgia with lesions of nutrition in parts supplied by other nerves, the only common meeting-place of which is in the spinal centres, also is a proof of the central origin of the affection. He does not consider that the nerve-plexuses with their reënforging ganglionic cells are often the channels of mutual pathological reaction of one kind of nerve with another.

He arrives at the conclusion: "1. That the assumption of a positive material centric change, as the essential morbid event in neuralgia

is almost forced upon us. 2. That whereas the morbid process, if centric, is *a priori* infinitely more likely to be seated in the posterior root of the painful nerve, or the gray matter immediately connected with it, than anywhere else, so again the assumption of this locality will explain, as no other theory could explain, the singular variety of complications (all of them nearly always unilateral, and on the same side as the pain), which are apt to group themselves around a neuralgia; and some of which are almost never absent in neuralgia of any considerable severity." With the exception of the "posterior root," we agree fully with this view.

The treatment recommended by Dr. Anstie seems to us judicious, and in many respects excellent. First he mentions the importance of improved diet; he says they require and are greatly benefited by a nutrition considerably richer than that which is needed by healthy persons. Cod-liver oil is advised where it can be taken, as the most easily-assimilated fat, a most excellent advice. Of medicinal tonics he places most trust in iron and arsenic, giving quinine we think too little credit; he also speaks well of phosphorus and strychnia. Perhaps it is scarcely necessary to repeat what is said in regard to the use of morphia and atropia hypodermically. The value of these remedies, thus used, is well understood. He believes that, in three cases, by the injection of sulphate of atropine ($\frac{1}{16}$ to $\frac{1}{4}$ grain) in ophthalmic neuralgia, he has saved the patients from threatened glaucoma. The local application of blisters, aconite, and veratrine, is mentioned, with a caution against using too strong applications in the aged, as too great an amount of skin-irritation may be set up. Surgical interference is generally discountenanced.

In regard to the use of electricity in relieving neuralgia, he is much more decided than in his former treatise. Since that time he has become more fully acquainted with the researches of foreign observers, and with the help of their indications has been able to inquire more successfully into the subject. "The result is, that I am now able to speak with far greater assurance of the positive value of electricity as a remedy for neuralgic pain. I shall make bold to say that nothing but the general ignorance of the facts can account for the extraordinary supineness of the mass of English practitioners with regard to this question." This is true of America. Too many of our physicians know almost nothing of the great benefits to be gained from the use of this agent, and have a groundless skepticism of all that is said in its favor.

Faradic electricity is useless; the galvanic current is the one to be

employed, but there must be as little variation of tension as is possible; the application should be made at regular intervals, at least once a day, and the sittings should last from five to ten minutes, not more than fifteen.

The divisions relating to prophylactic measures are very valuable, briefly reviewing the points which are of most importance in the care of children, in regard to study, mental training, in regard to food and physical training, the development of the muscular system, the sexual system, and in regard to sleep, ventilation, heat, etc. Except that it would make this article too long, and that each one can read it for himself, we should be tempted to make long extracts from this part of the subject.

In notes to the first part—a brief summary of the inhibition theories of Handfield Jones and Jaccoud—Dr. Anstie is inclined to accept Handfield Jones's theory that reflex paralysis is due to shock-depression produced in the nerve-centre by peripheral influence; and rejects the theory of Jaccoud that it is due to exhaustion of the irritability of the nerve-centre from over-excitement. We believe that reflex paralysis will be finally shown to result from nutrition changes in the centres, and we think that Dr. Anstie's reasoning in regard to the seat of the lesion in neuralgia, and the causes of the complications, all point in that direction, and are surprised that he has not advanced a step farther, and advocated the causation of reflex paralysis by such changes.

Another note is in regard to the value of the arsenical treatment, relating two new cases in which its value was shown in relieving, it might perhaps be said curing, angina pectoris. "It becomes more and more apparent that arsenic is generally applicable to *neuroses of the vagus*. In *asthma*, I have long held it to be the most powerful prophylactic tonic that we possess. It is also an excellent remedy in *gastralgia*."

The second part is devoted to a consideration of those diseases and morbid conditions which are most likely to be mistaken for neuralgia. The sketches are brief and well drawn. Myalgia is the first subject considered. "It is essentially pain produced in a muscle obliged to work when its structure is imperfectly nourished or impaired by disease." Faradization is not mentioned as a remedy in the treatment of this affection, yet the pain will not infrequently be relieved within a few minutes, and will not return subsequently, after the application of a mild current which produces neither pain nor cramps.

The condition known as spinal irritation is not altogether satisfactory, nor could perhaps so short a chapter deal with such a vexed and

vexing question other than incompletely. Dr. Anstie probably was aware of this, for he refers to Dr. Radcliffe's article in "Reynolds's System of Medicine" for a fuller account of the subject.

The description of hypochondriasis rather runs into insanity.

The chapter devoted to "Pains of Alcoholism" is a valuable contribution to the symptomatology of that condition. Any quotations would scarcely do it justice.

The other chapters of this part do not require any special mention. A copious index adds to the value of the work. If all books on medical subjects were as well provided in this last respect, most of them would be of much greater use.

Regarding the book as a whole, it is a valuable contribution to medicine. The symptomatology and treatment are all that could be desired. We have already expressed our views in regard to the portion devoted to pathology; in part agreeing with Dr. Anstie, but in part not able to arrive as yet at the same conclusions. In regard to the pathology, we cannot accept any theory as proved which is not supported by the results of post-mortem examinations.

Wilson's Psychology.

DR. WILSON has given the public a work,¹ in which, starting from a consideration of the body or rather of the nervous system, he reasons to the conclusion that there is in man a mind and that brutes have no mind. The old metaphysical "ideas" and "faculties" are proved not to exist. Many of the views advanced are rather new, and several chapters are of interest, and would probably be profitable for the students to whom the lectures were delivered. Especially Chapter V., on False Perception and Imagination, Chapter VII., on Appetites and Affections, and Chapter XII., on Memory and Recollection, are good views of these subjects; the same might be said of Chapters VIII. and IX.

The author has given first a brief *résumé* of the nervous system, especially of the cord and brain. He speaks of the posterior and anterior columns decussating in the medulla oblongata, also that the pons Varolii is a band of transverse fibres passing around in front of the column; a simple inspection of a section of this part would show that it is composed of an intricate interlacing of transverse and longitudinal fibres. One would suppose (p. 25) that Brown-Séquard assigned to

¹ Lectures on the Psychology of Thought and Action, Comparative and Human, by W. D. Wilson, D.D., LL.D., L.H.D., Professor of Logic and Metaphysics in the Cornell University, Ithaca. N. Y.: Andrus, McChain & Lyons, 1871, pp. 300.

the white posterior columns the function of conveying sensations, and that the gray matter was of secondary account. At p. 21, he states that "Van der Kalk has shown that the *corpora olivaria* are the organs of expression." Van der Kolk (not Kalk) says this of the *corpora olivaria superiora*. He speaks of the olfactory lobes as the olfactory ganglia and the organ of smell. Luys refers this name to ganglionic masses much more central. On page 31, *tabes dorsalis* is spoken of as softening of the posterior columns. In explaining swallowing, on p. 39, he states that "the sensation passes up the glossi-pharyngeal, and is returned as emotion by the hypoglossal nerve." The recurrent laryngeal is not mentioned, though its action is reflex, and would better illustrate his point.

A part of the fourth chapter is devoted to an enchanting consideration of what "might have been" if man only had more senses, or rather another sense. The velocity of electricity is given as about eighty thousand six hundred and seventy-five miles per second, and that of the nerve-current as two hundred feet per second, whereas the rate of electricity is nearer two hundred and eighty-eight thousand miles per second, and that of the nerve-current varies between about seventy-eight and ninety feet per second. His explanation of the action of the electric shock in moving the arm is certainly new: "A jerk of the arm, produced by an electric shock, implies the same state of the ganglionic mass in which the nerves of the arm originate, as that which precedes and causes the jerk, when that jerk is produced voluntarily by the mind acting as will" (p. 100.) Again, "As in the case of the electric shock, that while the external object produces a certain state of the ganglia of the spinal axis, and thus, by reflex action, contraction of the muscles," (p. 113). We have always supposed that the electric stimulus acted directly on the motor nerves; when the latter are divided, the same "jerk" occurs, yet the spinal ganglia are not affected. His view of delirium tremens (p. 109) is that the inner coating of the stomach is the first tissue affected.

He asserts that man differs from brutes in that he sees into external objects and understands them. His "insight" is a very convenient term, but we cannot agree with his theory and would refer all such phenomena to induction, which begins at an early age of life, long before the subject can express his mental processes or even understand them.

In regard to the great question of mind and will, the author denies all mind to beings below man, referring all those actions, which have been considered as proving a certain amount of mind in animals, to

instinct. He evidently considers mind and soul synonymous, and will as their manifestation. His illustrations and proof of this are not very fortunate. He supposes a person to meet some object which annoys him; he tries to remove it, and is not able; he then puts forth more strength, and, still not able to remove it, puts forth still more, the energy of the action of his will increasing with the resistance. "We might express this in a mathematical form. Let M represent motive, W will, and E the amount of effort required to remove the object; then dM , dW , and dE , will represent the varying intensity of each, and we have $dM + dW = dE$ If effort changes, while either motive or will remains the same, we know that the other element has changed just as much as effort has changed." In the case referred to, effort increased, the motive caused and measured by the annoyance remained constant, or the same and unchanged. Hence, therefore, will must have changed, and, to have changed, it must be something—a reality capable of change; it must be a reality capable of changing independently of the motive. Therefore, will or volition cannot be a mere resultant of motives. The same reasoning would lead to the conclusion that the decapitated frog, to whose thigh acetic acid has been applied, has will also, for, trying to remove it with the foot of the same side, if not able, he employs the foot on the other side.

He says again: "We often decide and act against the stronger, but lower motives, in favor of the weaker but higher." Are not in such cases the "higher motives" really the stronger?

A concession is made which a few years ago would have been strongly combated by most writers. "Even in our waking hours, and in the most resolute part of our lives, will is, I think, but a small and weak force in the production of human acts, and the formation of human character."

There are many passages we should like to quote, if this notice were not already sufficiently long, passages in which there are good common-sense remarks, and whose influence can only be beneficial. We have perhaps dwelt too much upon the errors and faults of the work; yet a book designed for students, written by a leading instructor in a widely-known institution, ought surely to be comparatively correct.

The typography is not particularly attractive, and there have been many errors in the proof, or perhaps in the manuscript. "*Corea*, or St. Vitus's dance" occurs on page 64. Mr. Braid has been changed into "Mr. Baird," p. 79. "Brahm" is certainly not the god of the Hindoos. "It only proves that the object has always been as it, or changed so slowly that the system," etc., p. 85. He speaks of various

kinds of sensation which extend "along up" the afferent or centripetal nerves, p. 96. On the same page, speaking of sensations peculiar to the subcutaneous tissues, "We have sensations of hunger and thirst, of fatigue and exhaustion after exertion. . . . The *optic thalami* are the special organ in which this change," etc., either the subject is singular or plural: if the former it requires a singular verb, if the latter a plural predicate. We did not know before that "timber" was the French for tone. We think we have said enough to show that the book, with much that is excellent, is on the whole rather inferior to what such a book should be.

Reich's Essays.

UNDER the title "*Medizinische Abhandlungen*," Würzburg, 1871, Dr. Edward Reich has collected a number of essays: "The World and Man;" "On the Value of the Study of Man to Science and to Practical Life;" "Age and Sex;" "On Education;" "The Care of Health;" "On the Diffusion of the Knowledge of Man and of Hygiene;" "On the Necessity of the Study of Health;" "Human Habitations;" "The Peoples of Antiquity;" "Narcotic Poisons;" "On the Animals which serve as Food to Man;" "A Contribution to the History of Sugar, Honey, and Butter;" "On the Illnesses of Society."

"The World and Man" is an essay upon the general relations of man and Nature, in which the author considers the degeneration, mental and physical, of the European races, and the influence of air and climate on man. He notices the greater robustness of northern peoples who have a rigorous climate to contend with; the relation of climate to fecundity; and the larger proportion of children in cities. He agrees, with Quetelet, in attributing a great influence to climate in mortality, and quotes the latter's tables which show in Northern Europe one death in 41.1 inhabitants; in Middle Europe, one in 40.9; in Southern Europe, one in 33.7. He says: "Experience shows that the physical climate acts the more upon the increase of the mortality the nearer we approach the equator. The influence of climate upon the tendency to crime is shown in the increase of crime in the more heated seasons of the year, and the larger number of crimes against the person in warm latitudes." The food and nourishment of a people have also a direct influence upon their character. He says: "Certain it is that food and diet have a decided influence upon human activity as the material ground-work of individual and social life, and upon its nature, quantity, and mode of use, greatly depends the condition of a people. Marriages, births, mortality, and crime, have a most intimate connection with the conditions of diet

and food. The influences of the dwellings of the individual and the nation are much greater than has been supposed." The author rails bitterly against the rich and luxurious classes, who, calling themselves Christians, allow their fellow-men to herd and live like beasts. He notices also the influence upon epidemic diseases of the dwellings and surroundings of a people. Proportionally to the health of a people are the grade of its education and the nature of its training. The most natural of all groups which man can form is the family, and warm and active family life is the surest and best source of national prosperity. "Age and Sex." Under this head the author notices the natural divisions of human life. He says: "I agree with Speiss, when he distinguishes three periods of life for the consideration of the general differences of physical structure, and the especial diseased conditions. Childhood, a period of evolution; ripeness, a period of stand-still; and old age, a period of involution; except that he denies any period of stand-still." He says our present race would be in a far better physical and mental condition if mothers lived more truly natural lives, and he insists strongly upon the deleterious influence upon the fœtus of an unnatural and pampered mode of life in the mother.

He says: "In the fœtal stage, and after birth, up to the period when the purely vegetative life becomes animal through the rousing of consciousness, the human being is not presented to us as such—the destruction of the fœtus is therefore no murder, in an actual sense; abortion, although the most shameful, noxious, and unnatural, in view of its corresponding measure of punishment, is yet very different from murder. Mankind is to be raised in its morality and virtue by general enlightenment, cultivation, and elevation; by these means abortion will be abolished. . . . Why," he cries, "do you punish the unfortunate girl who has in a moment of weakness given way to her seducer; and why do you punish adultery and licentiousness so severely? By a true hygiene, and by carefully educating and ennobling the people, by an improved bodily and mental training, you will make these crimes impossible." The author goes on to consider the different periods of human life each in detail as to its proneness to disease, its mortality, etc. Speaking of the need of every mother to preserve her health so that she may have strength to administer to the physical needs of her young, he refers to the effects of the want of natural maternal care of infants as shown in the mortality of foundling hospitals, which he calls institutes for murder. As regards the differences between the sexes, he says there exists no qualitative, but rather only a quantitative difference between the male and female sexes. We can merely ascribe to man a greater animal existence, to woman a greater vegetative life. In

his chapter on Education, the author details his views of the needful qualifications of a teacher, and insists upon the necessity of strengthening the mind gradually to receive the knowledge imparted to it, and therefore repeating the old saying, "*Mens sana in corpora sano.*" He minutely details his views upon physical and mental training, dating the former to the pregnant state, and following them up to manhood and womanhood. The author bitterly inveighs against the present disregard of all hygienic laws and the follies and dangers of the present system of education. He holds the state in a great degree responsible for the degradation of all classes, and insists that man can only freely develop in healthy proportions when surrounded by civil liberty. He shows how the spread of epidemic diseases, and how diseases generally, might be abated by a more wide-spread knowledge of the laws of health, and insists that anthropology and hygiene should be made part of the instruction in all schools and universities. He details the ills of improper, dark, ill-ventilated dwellings in a separate chapter; and describes minutely how every dwelling should be built. In the chapter on the "Nations of Antiquity" the author gives the results of much research, principally into the questions of state hygiene; the exposure to death of such children as gave evidence of weakness or deformities at birth; also the laws regarding marriage and celibacy; and the intermarriage of blood-relations. In a chapter on stupefying poisons he gives the history of narcotics in use in antiquity and in later times, and a minute description of their employment and effects. In speaking of tobacco, he says: "We readily recognize that, by the use of tobacco, political and social life is much affected, and that in both departments of life some good and more evil is produced by it; but it cannot be regarded as a poison—society as such is not poisoned by it physically or socially—is neither disturbed nor demoralized."

The author follows with a description of the animals whose flesh serves as food to man, and therein shows much patient labor and research; presents, however, nothing especially new or interesting on the subject. He then gives an historical sketch of honey and sugar, and their employment by the different nations from the remotest times. He completes his work with an essay on the "Diseases of Society," and their probable causes. Among these, syphilis and scrofula are the most prominent. He regards the collecting of operatives in factories as a powerful agent in the spread of social diseases, as it brutalizes mankind mentally and physically. He regards the sole cure for these, and the other degenerations alluded to all through his work, as being an improvement of mankind by political freedom and general instruction of the masses in the human system and its needs.

CHRONICLE.

I.

LETTER FROM GEORGE FIELDING BLANDFORD, M. D., LECTURER
ON PSYCHOLOGICAL MEDICINE, AT ST. GEORGE'S HOSPITAL,
LONDON.

THERE have been several trials in this country, since the beginning of the year, in which insanity has been alleged for the defence, and concerning them there has been the usual amount of irrelevant writing in the public papers, of virulent abuse of so-called "mad doctors," and of laudation of the virtues of British juries as shown by their disregard of such doctors' "theories." Yet, as has been remarked by the editor of the *Journal of Mental Science*, "had the wit of man been employed to devise a tribunal more unfitted for such a purpose, it might have exhausted itself in the vain attempt. In this most momentous issue, however complicated the circumstances, however obscure the facts, a man on trial for his life must stand the verdict of twelve common jurymen. The very terms of science they are ignorant of; and they either accept the data blindly on the authority of a skilled witness, or reject them blindly from the prejudice of ignorance. The former result is commonly what happens in regard to scientific evidence of poisoning; the latter is commonly what happens in regard to scientific evidence of insanity. It is an additional evil of the present system that judges too often share the ignorance of juries, and surpass them in the arrogant presumption which springs from ignorance. Instead of urging them to throw off all prejudice, and aiding them with right information, they sometimes strengthen their prejudices by sneers at the medical evidence, and directly mislead them by laying down false doctrines. They may even go so far as to flatter them in the opinion that they, as men of common-sense, are quite as well able as medical men to say whether a person is insane or not. One cannot justly complain that judges should be ignorant of insanity, seeing that only by long experience and study is a true knowledge of it to be acquired; but it is a fair ground of complaint that, being ignorant, they should speak as confidently and as foolishly as they sometimes do. Here, as in other scientific matters, it is not intuition, but experience, which giveth understanding. Not only is it the fact that judges are ignorant, but they are too often hostile. Governed by the old and barbarous dictum that knowledge of right and wrong is the proper criterion of responsibility when insanity is alleged, they resent angrily the allegation of insanity in any case in which the person has not lost all knowledge of right and wrong. There is a direct conflict between medical knowledge and judge-made law, which must go on until bad law is superseded by just principles in harmony with the teachings of science." Space forbids the quotation of this article at length, but, to all interested in this subject, its perusal may be recommended. Although the facts of these various cases are probably fresh in the minds of most readers, I propose to touch upon

the salient points of three or four of them, for by the events of such trials we may better perceive the defects of the present system, and devise some method by which a just judgment may be arrived at. The trials which created the greatest discussion and difference of opinion were those of the Rev. John Selby Watson for the murder of his wife, and of Christiana Edmunds for the murder of a little boy named Barker. Mr. Watson had been master of a proprietary grammar-school at Stockwell: this school had declined of late years, and Mr. Watson had in consequence been dismissed from the post of head-master, and at the age of sixty-eight was deprived of all income, and reduced to entire poverty. One Sunday afternoon, on the servant returning from church, she was let in by her master, who said that her mistress had gone from home, and would not be back till the next day. He took his supper, remarked afterward to the maid that he had spilled some port-wine on the carpet, and went to bed. The next day he said his wife would not be back for several days, and came and went on this and the following day as usual. On the evening of the latter day he told the servant to send for his medical man if any thing was wrong with him. The next morning he went out, came in again, and at about twelve o'clock the girl heard him groaning; went up-stairs, and found him in bed, unconscious. The doctor was fetched, who says that Mr. Watson was unconscious, breathing with difficulty, with a cold, clammy perspiration on him, and a weak, soft, compressible, and intermittent pulse. He was unconscious for about a quarter of an hour. A paper was found in the bedroom addressed "to the surgeon," which ran as follows: "I have killed my wife in a fit of rage to which she provoked me. Often, often has she provoked me before, but I never lost restraint over myself with her till the present occasion, when I allowed fury to carry me away. Her body will be found in the room adjoining the library, the key of which I leave with this paper. I trust she will be buried with the attention due to a lady of good birth. She is an Irishwoman; her name is Anne." Another paper contained a statement of his worldly affairs, books, MSS., etc. The body of his wife was found in the room he mentioned, the skull fractured, and many wounds on the scalp, hands, and arms. In a glass by the bedside, and in a phial, there was some prussic acid; a horse-pistol was found, with which it appeared that the murder had been committed, and in the time between the committal of the act and the attempt at suicide he had ordered a large box for the purpose, as it was supposed, of packing and so getting rid of the body, but which he himself avers was only intended for books and papers. The theory of the defence was, that Watson had become melancholic, owing to the loss of his daily work and employment, the prospect of poverty, and the failure of strength from approaching old age. His conduct immediately after the murder appeared frivolous and childish, such as to suggest approaching imbecility, while extraordinary depression and an entire change of demeanor and aspect had been noticed prior to the act by several persons. A clergyman and his wife testified that, upward of a month previously, Mr. Watson had come down to do duty on Sunday, and had lunched and dined at their house. The whole of the day he appeared so weak, dreary, and listless, as to attract

their notice, and the clergyman, though unwell, did a considerable part of the duty himself. He replied only in monosyllables, did not originate a single observation, and seemed dejected and depressed in the highest degree. His condition was attributed by them to natural decay, consequent upon old age. Another witness, who had known Mr. Watson by sight and reputation for twenty years, met him on the day preceding the murder, gesticulating, and shaking his clinched fist, with his eyes glaring. He had to step out of his way, and noticed his extraordinary look, and thought that his "mind was going." A clergyman who visited him in prison, and had known him previously, said that his conversation and intelligence were very unlike what he had previously observed. He was anxious about his house and library, and made this remark: "Here's a man with whose Latin the Bishop of Winchester has been pleased, and they have shut him up in a place like this." The medical witnesses differed in opinion. Of two experts who had examined him on the part of the crown, one thought him insane, the other sane. The surgeons of the two prisons pronounced him sane; two experts, called for the defence, thought him insane; two other practitioners also were of the latter opinion. The judge summed up strongly in favor of his insanity, but the jury found a verdict of "guilty," strongly recommending him to mercy. This was understood to be a compromise, five of them thinking him insane, the other seven opposed to this view. They had been locked up two nights and three days, and so a verdict was given, which was on the face of it an absurdity, in order that he might not be hanged. He was reprieved, and the sentence commuted to penal servitude, on the recommendation of the judge. This trial deserves some few comments, for it was in some respects remarkable. It was distinguished throughout by the calm dignity, patience, and fairness of judge and counsel. Both the former and latter endeavored to elicit the truth from the evidence, and not to obscure it by Old Bailey bullying of the witnesses. From a medico-legal point of view it is to be recollected that there were indications of mental alteration and depression noticed before the act, and that comments upon this alteration had been made by witnesses prior to the commitment. This is, perhaps, the most important point in any case in which insanity is alleged. Frequently, evidence of this is wanting, where the companions of the alleged lunatic are unobservant, or of uneducated and ignorant minds; and here, though the witnesses were unimpeachable, they were few, owing to the extremely retired life which Watson and his wife led. There was an absence of sufficient motive for assuming that there had been a quarrel; it was an occurrence which not unfrequently happened according to the same confession, and beyond the latter there was no evidence of any cause whatever. The melancholic depression noticed by the witnesses was such as might well have terminated in suicide, even if no homicide had taken place, and if the attempt at suicide had been successful, and it was by a mere miscalculation of the strength of Scheele's acid that it was not, who can doubt, as the prisoner's counsel urged, that the verdict of a jury would have been "insanity?" Only the other day a poor shoemaker, whose failing health and failing eyesight brought home to him the fact that his

means of earning bread for his family were fast departing, cut the throats of four of his children and afterward his own. A verdict of temporary insanity was recorded, and every one assumed that about this there could be no doubt. Had this man's suicide not been carried out, it is of course impossible to say what his state of mind observable might have been, but it is conceivable that no greater aberration might have been discoverable than there was in the case of Mr. Watson. For it is a fact well known to scientific observers, and amply recorded in their writings, that with the deed the insane emotional state may pass away. As Griesinger says, in a passage quoted in the article to which I have already adverted: "In regard to a great many of these cases" (of violence toward others), "there is a most important and characteristic circumstance which we have already adverted to in speaking of suicide, namely, the freeing of the patient from his painful emotions and thoughts by the fact that the deed committed has become objective to him: the ease and calm which he gains by the expression of his mental suffering in the accomplishment of the deed—a circumstance which gives to these acts what has been termed a critical significance." This, though a scientific truth, is one which has no meaning for a common jury, who cannot imagine a prisoner to be a madman, who sits grave and composed in the dock, without wild demeanor or raving.

The case of Christiana Edmunds is, in some respects, one of the most extraordinary that has ever occurred, whether we consider the nature of the crime, the incidents of the trial, or the final termination. She was accused, as will be remembered, of causing the death of a little boy, unknown to her, by means of poisoned chocolate-drops. These she conveyed to a confectioner's shop by exchanging them for others bought there, which she returned as not being those required. The circumstances which led to the detection of the crime need not now detain us; the motive of it, however, must be mentioned. She had formed the acquaintance of a Dr. Beard, and in September, 1870, she gave to his wife a chocolate-cream which made her very ill, and aroused suspicions of poisoning. She was accused of attempting to get rid of Mrs. Beard, having a strong affection for the husband; and, owing to the latter having ceased to speak to her, she attempted to shift the blame from her own shoulders to the confectioner's, by making it appear that he sold poisoned sweets. However, she was proved to have bought, under a false name, considerable quantities of strychnia, and to have exchanged sweets more than once, and also to have given sweets to other children, who were more or less ill after eating them. On the facts there was no defence, but it was alleged that the prisoner was insane. The chief evidence was her family history. Her father died in an asylum. Her mother's father was paralyzed and imbecile, and died in a fit at the age of forty-three; a brother of the accused was an epileptic, and died in Earlswood Asylum; a sister was hysterical, and tried once to throw herself out of a window; a first cousin was an imbecile. The prisoner herself had suffered from hysteria, had been a somnambulist, and had had paralysis, probably hysterical. Her mother said she was greatly excited about the Beards, and two witnesses, in whose house she had lived, had a twelvemonth

before noticed an alteration and wild look about her, and she had said she felt as if she were going mad. The chaplain of the jail believed she was of unsound mind, and three experts were of a similar opinion, chiefly on the ground that she was utterly deficient in moral sense, as is found in the descendants of insane persons. The judge summed up most violently against the defence of insanity, remarking, which is untrue, that "a poor person was seldom afflicted with insanity, and it was common to raise a defence of that kind when people of means were charged with the commission of a crime." The result was, that the jury found her guilty of murder. She then pleaded pregnancy, and a jury of matrons was empanelled, who, with the assistance of some medical men, found her not pregnant. Now comes the extraordinary part: the judge, after violently attacking the doctors for the defence, making the unseemly assertion that the defence of insanity was only raised when the accused was a person of means, and uttering as a joke a saying of some one that all mankind were mad, seems to have reflected at his leisure that it was possible that there was something in what was urged by the prisoner's witnesses, and accordingly directed or suggested a further examination by other medical men. Sir William Gale and Dr. Orange, the superintendent of the Broadmoor State Lunatic Asylum, had an interview of four hours with Miss Edmunds, and upon this pronounced her insane: the grounds of their opinion, however, they did not give. It will be remarked that in this case the crime was not of the sudden nature of Watson's: an idea of homicidal impulse must be abandoned. Neither was it motiveless, for the accused plainly wished to remove from her own shoulders to those of others the imputation of having poisoned the chocolate-creams eaten by Mrs. Beard. Prior to the act there was the very slightest indication of insanity, and after it all that the witnesses could discover was an absence of moral sense, which does not, according to English law, constitute legal irresponsibility. Yet she has been acquitted, not by law, but by doctors. I quote from the same article: "When all the unsoundness discoverable in a person accused of crime is so very like that moral insensibility which, in greater or less degree, marks the criminal nature, it is no wonder that the public get alarmed, and the lawyers angry. But medicine cannot forego its inquiries or falsify their results on that account; it is a fact of observation that the insane heritage does sometimes make a person very unlike other persons, and greatly diminish his moral sensibility; the evidence is irresistible, and it is vain to shut our eyes against truth, whatever inconvenient results may follow from admitting it." One thing strikes us in reading these two trials and their results: whereas formerly much stronger evidence was required to prove legal insanity in a criminal than in a civil case, at present this is altogether reversed. Formerly a murderer was not held to be legally irresponsible, though he was a madman whose will would have been upset, and who could have been legally confined under certificates, unless he was in such a condition that he could not know right from wrong; now we see the defence of insanity extended to those whose wills could hardly have been overthrown by any evidence of insanity as yet discoverable in them. And

the result of this will be, to widen still more the breach between lawyers and doctors, unless some alteration in the existing procedure takes place. The doctrine of the knowledge of right and wrong is the first thing that must be abolished. The judges feel themselves that this is an exploded error, and never introduce it without placing it on the shoulders of the bench, who laid it down in Macnaughten's case, so relieving themselves of the odium of it. From remarks made by the judge in Watson's trial, it is evident that this question has been discussed by the present bench, and that they are by no means agreed concerning it. The effect of its retention is that insane persons are legally condemned by a jury under the direction of a judge; and then, if they have interest enough to get their case investigated after trial, they are retried by the Home Secretary, or under his direction, and, it may be, acquitted on the ground of insanity, or the sentence is commuted. If, under the present system, a prisoner is incarcerated in a county jail, and is a person without means, and the trial is held in a country assize-town, far away from experts versed in insanity, it may easily be conceived that, with this interpretation of the law, the unfortunate lunatic is most probably doomed to death, being as unable to procure a rehearing as a scientific defence. This is probably what was in Baron Martin's mind when he asserted that such defence is not set up for poor persons. The crown does not undertake to provide the defence, but only prosecutes; and it is matter of accident if the insanity be proved, unless it be of a kind which is patent to all observers.

Those who are most dissatisfied with the administration of justice as it is, and most loudly call for reform, will regret that the plea of insanity was set up in the case of O'Connor, the boy who held a pistol to the queen. An attempt was made to show, not that the prisoner was insane when he committed this piece of foolishness, but that he was so insane that he could not even plead "Guilty" or "Not guilty" when called upon, and on this point the jury felt themselves competent to form a conclusion, even without hearing witnesses to rebut those who set up the plea. Here, again, hereditary taint was the thing chiefly relied upon. It is possible, however, to push this to an extent incompatible both with science and with law. The boy was a great-nephew of Fergus O'Connor, who died, if we are not mistaken, of general paralysis. If moral insanity due to hereditary transmission may be derived from relatives so far removed as great-uncles, the plea may be extended to a vast number of people. For insanity, after all, though studiously concealed, is not such a very uncommon complaint, to say nothing of epilepsy, paralysis, and other nervous affections. It is quite another matter when the father or mother of the accused has been in an asylum, as in Miss Edmunds's case. Moreover, it is very difficult to understand from the evidence, as we read it, under what description of unsoundness of mind Arthur O'Connor was supposed to be laboring. Watson was alleged to have been melancholic, Miss Edmunds was "morally insane," but O'Connor, what was he? Dr. Tuke says, that "he gave a perfectly clear and intelligible account of the outrage, and there was no indication of insanity in that. His manner,

however, indicated a hypochondriacal state of mind, and he seemed to have a very gloomy opinion with regard to his bodily ailments. He thought it a delusion on the part of the prisoner for him to think that the queen would have signed such a document. This, if any thing, is insanity; but, Dr. Sabben, the only other lunacy-doctor examined, thought him approaching an imbecile—too imbecile, in fact, to plead. It does not appear that any one had ever questioned O'Connor's sanity prior to the act. In Watson's case, various persons had thought him changed and out of his mind prior to the homicide, and in Miss Edmunds's case there was some evidence that she had not been thought quite right, but neither O'Connor's father nor mother went so far as to say that he or she had looked on him as insane or imbecile. He was a clerk in a warehouse at the time, and no complaint was made of him. He was weak in health, doubtless, but it does not appear that he had been treated as different to other lads. Now, we are far from asserting that insanity is always discoverable prior to the commission of an insane act: acts of homicide have been committed by persons in whom the outbreak of violence was the first symptom; but an act of homicidal impulse is a very different thing from an act such as O'Connor's; and we think that, if the latter was not one of conceited folly, it would, in all probability, be that of a person in whom some indications of insanity would have been previously noticed. Insane persons are constantly trying to gain access to Buckingham Palace. Several of these have come under our own notice, but as a rule their insanity is remarkably manifest, and is displayed in evident and characteristic delusions. This case gave, of course, great occasion to the lay-press to sneer at mad-doctors, and was a great triumph to its writers, and to the lawyers, who were deeply aggrieved at the result of the trials already mentioned.

The trial of Dr. Minor, an American gentleman, for a homicide which will be fresh in the recollection of our readers, was happily marked by an absence of any legal wrangle on the question of knowledge of right and wrong, or by any difference of opinion on the part of medical witnesses. The accused, according to the evidence of his brother, had sustained a sunstroke, and been in a lunatic asylum. He after this continued to suffer from delusions that he was persecuted and a marked man; he heard noises at night, and thought that people came into his room to disturb him. Being at large and under no restraint, he went out early one morning, and, probably under the influence of these delusions, shot an unfortunate man wholly unknown to him, who was going to his work. He had previously gone to the police and complained of being persecuted by the Fenians, and of his insanity there was no doubt. The judge stopped the case and directed an acquittal, if the evidence satisfied the jury that "the prisoner at the time he committed the act was not in a state to distinguish right from wrong, and was not capable of controlling his actions." We quote from the *Times* report. If this is correct, the addition made by the judge to the usual formula is important. Neither of the judges in the Watson or Edmunds case said a word about capability of controlling actions, neither do we think that it was contemplated that it should be

put in this form to a jury by the bench of judges of 1843. Yet it is a question which should certainly be submitted, though there may be a doubt whether jurymen are the persons most fitted to decide, for the responsibility of an offender lies in his being able to abstain from what he does. An insane person may know right from wrong in the abstract; but if, by reason of his insanity, he is driven to homicide, and is so under the influence of the disorder that he cannot restrain himself from violence, clearly he should not be held responsible. Here, again, we see, as we have remarked elsewhere, how judges vary in their interpretation of the law. Probably Dr. Minor knew in the abstract as well as Miss Edmunds that murder was wrong, yet the judge directs his acquittal. The judge directs in the most violent manner the condemnation of Miss Edmunds, if the jury think she knows right from wrong. The jury find her guilty accordingly, nobody doubting that she possesses such knowledge. And then the judge directs or sanctions her being further examined by two other doctors, who pronounce her insane, but give no opinion as to her knowledge of right and wrong. She is then acquitted on the ground of insanity, and placed in an asylum. The sentence is not commuted, but reversed, and the previous trial is rendered a farce. Of course, every one feels either that the jury in the first instance were competent to decide the question, in which case the verdict ought to have been upheld; or they were not, in which case trial by a common jury ought to be abolished. But those who look further know well that the alteration most urgently required is in the form in which the question is put to the jury. They should be asked, Was the accused insane or not, when the act was committed? Whether a common jury is competent to decide such a point is another matter. In civil cases a man's insanity is always weighed by a special jury, but it is not uncommon to find in English law that property is more jealously guarded than life or person. We have our own ideas on the reforms required, but it would be out of place to give them here.

At a meeting of the Royal Medical and Chirurgical Society, February 13, 1872, a paper was read by Dr. W. H. Broadbent on "The Cerebral Mechanism of Thought and Speech," the object of the author being to construct a theory of the mechanism of thought and language by means of the light thrown upon cerebral physiology by cases of loss and derangement of speech, and to connect this with the facts of cerebral structure so far as known. Ten cases were related, all corroborative of the view which assigns a close functional relation with speech to that part of the upper edge of the fissure of Sylvius which forms the posterior extremity of the left third frontal convolution; and as the result of his own observations and of examination of many cases published as exceptions, the author considered this relation to be absolutely established; not that it is to be expected, however, that lesion of this part of the hemisphere will be found in every kind of loss or derangement of speech: it is not the seat of a faculty of language, but simply a part of the nervous or cell-and-fibre mechanism by means of which speech is accomplished, which mechanism may be damaged elsewhere, above or below this particular node.

It has been shown by previous writers, Sanders, W. Ogle, Bastian, and others, that there are at least two distinct classes of cases in which speech is deranged or lost: 1. The *amnesic*, in which the patient has forgotten words, and has an imperfect mental rehearsal of phrases; and 2. The *aphasic* or *ataxic*, in which the patient rehearses sentences in his mind, and remembers words, but has forgotten how to say them. Obviously the breach in the apparatus has occurred at different points in these two classes, and to look for lesion in the same part of the hemisphere can only lead to confusion. Again, in each class the functional derangement may be—1. *Paralytic*, the patient having lost words; or, 2. *Incoördinate*, he having plenty of words, but using wrong words—a distinction insisted on by Dr. Hughlings Jackson, who says that this difference indicates the nature of the lesion—destruction of the fibres or gray matter on the one hand, irritability of cells on the other. But there is room for a further analysis of cases included under the term *amnesia*. In one of the cases related, the mental powers were comparatively little impaired, the faculty of intellectual expression by speech and writing was almost intact, but the sight of an object failed to revive the name; in other words, the supreme centres and the outward path from them to the proper motor centres were unaffected, but the upward track from the visual perception centre to the supreme centres was cut across. If we suppose an analogous severance of the auditory perception centre from the supreme or intellectual centres, so that an articulate sound no longer revives the accustomed intellectual associations, the individual, though possibly capable of reasoning correctly, and correctly rehearsing his thoughts and conclusions, would on the one hand be incapable of understanding what was said to him, and, on the other, would have no check on his own utterances.

Roughly speaking, loss of derangement of speech may arise from affection—1. Of the supreme centres in *amnesia* proper, *paralytic* or *incoördinate*; 2. Of a part of the nervous apparatus lying in the ascending track of sensations toward the supreme centres; 3. Of the first part of the path outward from the supreme centres to the motor centres. The author considers that he has made out the following important points in the structure of the cerebral hemispheres: The radiating fibres issuing from the central ganglia are not distributed to all the convolutions, but chiefly, if not exclusively, to the convolutions forming the two margins of the hemisphere, i. e., the margin of the great longitudinal fissure on the one hand, and the margin (especially the upper) of the fissure of Sylvius and the convolutions forward and backward in a line therewith on the other. The fibres of the corpus callosum are distributed to the very same convolutions as the central radiating fibres, but in different proportion. But large tracks of convolution have no direct connection by means of fibres with either crus central ganglia or corpus callosum: these are the convolutions on the under surface of the temporo-sphenoidal lobe and orbital lobule, those of the island of Reil, those on the inner flat surface of the hemisphere, and those on its outer convex surface behind the second ascending parietal gyrus. A great part of the white substance of the hemispheres consists of fibres which connect different parts of the cortical gray substance together, running

for the most part longitudinally along the convolutions rather than immediately from one convolution to another transversely, the deeper fibres which join distant parts forming three great longitudinal systems : 1. That of the fasciculus uncinatus ; 2. That of the gyrus fornicatus ; 3. The great axial system of the hemisphere.

It is inferred that these convolutions, which have no direct connection with the sensory ganglia, and are, so to speak, withdrawn from immediate relation with the outer world, will be those concerned in the mental operation proper, receiving from the convolutions on which sensory impressions impinge the raw material of thought, and employing those which are in relation with the motor tract to express the product. This inference is supported by comparative anatomy and the facts of development.

The hypothesis concerning the mechanism of thought and speech applied to the above facts is a modification of that of Dr. Bastian (*British Medical Journal*, May, 1869). The following points are condensed from Dr. Bastian's paper : That words are revived as remembered sounds ; that the materials of thought are remembered impressions, and not remembered movements or motor intuitions ; that, when similar mental operations are repeated, certain definite parts of the hemispheres are called into activity ; that, when past impressions are revived, the same parts of the hemispheres must be called into activity as were concerned in the perception of the original impression ; that there are definite cell-areas, called by him perception-centres, in the cortex of the hemispheres, connected by fibres with the different sense-centres, in which impressions are converted into "perceptions," that is, undergo intellectual elaboration—a process which implies an intimate cell-and-fibre communication of each perception-center with every other perception-centre, since the perception-act is the fusion into one state of consciousness of knowledge derived in different ways.

The principal modification of Dr. Bastian's hypothesis is, that to his "perception-centres" is relegated only the rudimentary or primary perceptive act, by which the external cause of a given sensation is recognized ; the higher intellectual elaboration (sometimes distinguished as conception), by which an idea of an object is conceived or formed by the fusion of various perceptions gained through the different senses and associated with a name, being a new and distinct process effected, not by the radiation of impressions from one perceptive centre to the others, but by a convergence from different perceptive centres to an intermediate cell-area. The perceptive centres will be somewhere in the marginal convolutions, the higher centres in some part of the superadded convolutions.

A theory of the mechanism of thought should include an hypothesis as to the nervous change which is the concomitant of sensation or consciousness. This, in the author's opinion, is constructive change in the nerve-cells upon which an impression has impinged, and in the production of which the impression expends itself, instead of the usual destructive change, and transmission of an intensified impression to muscles or some other centre—integration of matter and absorption of energy, instead of disintegration of matter, and evolution of energy.

which may be illustrated by the fixation of luminous vibrations by constructive chemical change in plants. On this view, the seat of conscious sensibility will vary in different classes of animals; and, in man, the seat of the more important and more constantly-recurring states of consciousness will vary in the successive phases of the development of the intellectual faculties, and will shift upward from the thalami in the infant successively to the perceptive centres and to the supreme centres in childhood and adolescence.

Considering first the mechanism of speech, and taking for granted that the left third frontal gyrus is specially concerned in this, we may regard words from two different aspects: 1. As motor processes; 2. As intellectual symbols. As motor processes, they are the result of movements of the lips, tongue, larynx, etc. In volitional movements of these parts, other than those of speech, the corpus striatum is interposed as a motor ganglion between the hemispheres and the cord which formulates volitions into actions, i. e., it selects, so to speak, the nerve-nuclei which are appropriate for the performance of the given movement. In terms of "cells" and "fibres" a given movement will be represented by a particular grouping of cells in the corpus striatum, the descending processes of which will be continued as fibres to the different nerve-nuclei. Either, then, we have in the corpus striatum all groups representing words, or rather articulate sounds, or there must be two descending tracts of fibres to the nerve-nuclei, one set from the corpus striatum, the other from the third frontal gyrus. The only route for the latter will be through the corpus striatum, and they would be involved in severe lesion of this ganglion. Thus the fact that loss of speech does not arise from lesion limited to the corpus striatum is equally a difficulty, whether we suppose words to be represented by cell-groups in this body, or to be transmitted by fibres passing through it.

Examples of words as motor processes without reference to their use as intellectual symbols are afforded by the speech of parrots or certain imbeciles; the learning of words simply as motor processes consists in the acquirement of certain complex movements by imitation of sounds heard, which, represented objectively, will consist in the grouping of cells under the control of the auditory centre, just as in reflex action the impulses issuing from an anterior nerve-nucleus are regulated by the impressions received by and transmitted from the cells of the posterior nerve-roots. These movements have in themselves no intellectual quality, and there is no reason why the cell-groups representing them should not be found in the same ganglion as those for the movements of the same parts, i. e., the corpus striatum. But the nerve-nuclei of the special sense of hearing being bilaterally associated, and sending up fibres from a common nucleus to both halves of the cerebrum, the word or sound groups will be formed in both corpora striata. Once formed, they may be called into play by various other centres. Their predominant employment will be in intellectual expression, and, as the left third frontal gyrus is the "way out" for this, the sound-groups in the left corpus striatum will take the lead in speech. A way round from the left third frontal to the right corpus striatum exists by

the corpus callosum and right third frontal, by which speech is possible when the left corpus striatum is damaged; the delay in bringing the way round into use explains, what the author believes to be the case, that greater and more prolonged temporary embarrassment of speech is met with after lesion in the left than in the right corpus striatum, limited to the ganglion. Again, if word-groups exist in both corpora striata, the emotional and interjectional escape of words and phrases is understood.

No attempt is made to explain the almost exclusive employment of the left hemisphere in intellectual expression; but, accepting this as a fact, the highly-special, complex, and definite character of the volitions to be expressed in movements will imply a very definite connection by fibres of some part of the hemispherical cortex with the word-groups in the corpus striatum, on the same principle as the cell-groups in this ganglion, communicating with nerve-nuclei in the medulla and cord, will be large and definite, and send off many descending processes, when the movements to be executed are special and complex; whereas, when the movements are simple and general, the cell-groups will be small and variable, and the descending processes few, the coördination being relegated to the cord.

In explanation, the author remarks that the anatomical fitness of that part of the upper edge of the fissure of Sylvius, which forms the third frontal convolution, for acting as the outlet of language, consists in its position in the motor edge of the hemisphere, and its direct and large connection with the corpus striatum; and, on the other hand, in its peculiarly extensive and elaborate communications with other convolutions.

As intellectual symbols, words are primarily revived or recollected auditory impressions, and are probably represented in the auditory perception-centres by receptive cell-groups. A degree of persistence, the result of frequent repetition of the impression, is a condition both of the formation of the motor cell-groups for utterance, as already mentioned, and of employment as a symbol. For the latter purpose the auditory impression constituting the name of a given object is associated with the visual, tactual, and other impressions to which the object gives rise, and by an intellectual operation the name is made to stand for the resultant of the impressions generally; that is, the impressions are transmitted onward, from the various perception-centres, and converge to a superadded common cell-area, where they are combined and translated into an idea of which the word is the symbol. This intellectual elaboration and the formation of motor word-groups are two entirely different and independent processes. A child knows the names of familiar objects long before it can utter them. The case of congenital aphasia related is a more striking illustration. A name used as a symbol, and a word repeated from imitation or by rote, differ essentially: they will start from two points of the centre, and will reach the word-groups in the corpus striatum by different routes. Words other than names, such as adjectives, verbs, etc., constituting the framework of a sentence or proposition, are not associated with and tied down by visual, tactual, or other perceptions. Their use

marks a step beyond the act of naming in the direction of speaking and formed sentences. The convolutions concerned in their employment will be those which are the seat of intellectual operations. Even as regards the auditory perception-centre by means of which the sound-groups representing them were formed, they are not revived as objects of consciousness, but are used automatically. These considerations enable us to understand approximately how names may be forgotten, while the framework of a sentence is readily uttered, and even a periphrasis for a required name invented.

The action of the hemispheres is apparently necessarily bilateral, so far as the formation of rudimentary perceptions, the convolutions, which, from their receiving central fibres, are considered to be the seat of the primary perceptive centres, being joined together by the corpus callosum. The unilateral employment of the left hemisphere revealed by pathology only becomes possible in the superadded convolutions.

The mechanism of thought prefigured in that of language is further briefly illustrated by the process of sensory education, the first stage of which is the recognition of an external cause of sensation. The primary perceptions of color, form, resistance, taste, odor, sound, are formed in perception-centres, which, for reasons given, are believed to lie along the margin of the hemisphere (probably the upper margin and posterior extremity), by the opening up of paths through ascending fibres to these parts from the thalami. These rudimentary perceptions are associated and fused into an idea of a given object by conveyance of impressions from the various perception-centres to a cell-area in some superadded convolutions. The further degrees of intellectual elaboration are not yet traceable, but the process of thinking or cerebration, conscious or unconscious, is conceived to consist in transmission of impressions from one cell-area to another in the same or opposite hemisphere along the complicated commissural fibres.

In the last volume of the St. Thomas's Hospital Reports there is a paper by Dr. Bristowe, on "Impairment or Loss of Power of Articulate Speech," in which he enumerates several interesting cases of this disorder. Dr. Bristowe divides such patients into four classes: 1. Cases in which the motor nerves of the organs of speech are paralyzed in a greater or less degree, and where the defect of speech is simply the result of inability to use these organs; 2. The class in which the coördinating centre of the movements of articulation is affected, and where the patient, having complete control over the movements of his lips and tongue for all other purposes, is yet unable to utter articulate sounds; 3. The class in which the impairment of speech is central, where there is loss of memory of words or *amnesia*, and other losses of mental attributes—a class which includes all cases of pure amnesic aphasia and many of so-called "ataxic" aphasia; and, 4. A complex class, to include all those cases in which the conditions characteristic of the second and third classes are combined.

The cases given are some of them very interesting, but there is nothing new in them. The chief point to be noticed is, that Dr. Bristowe, quite independently of Dr. Broadbent, makes the corpus striatum or some lower centre the seat of coördination of the movements for the utterance of words.

A very interesting case of a lesion involving Broca's convolution without Broca's aphasia is given by Drs. T. Batty Tuke and John Fraser, in the *Journal of Mental Science*, April, 1872. The patient, a female, aged fifty-four, single, was admitted into the Life Asylum, in December, 1868. She labored under delusions and hallucinations, and under these tried to get out of her window in the night, and was in consequence brought to the asylum. The history was, that eleven years previously she had had an apoplectic seizure, falling down unconscious. There was no paralysis, but she was insensible "for some weeks," and complete speechlessness existed for some time. From this she must have totally recovered, but she remained weak-minded. She lost her delusions in the asylum, but always thought that Thursday was Sunday, and would not work on that day. During her residence, two peculiarities in her speech were observed—a thickness of articulation, resembling that of general paralysis, and a hesitancy when about to name any thing, the latter increasing very much some months previous to her death. The thickness seemed due to slight immobility of the upper lip when speaking, but there was no paralysis, when the lip was voluntarily compressed against its fellow. The hesitancy was most marked when she came to a noun; the hiatus varying in duration according to the uncommonness of the word. Latterly, she could not recall even the commonest terms, and periphrases and gestures were used to indicate her meaning—never did she hesitate to articulate the word when she heard it.

"She became paraplegic two months before death. There had been a peculiar stoop in her walk for many years, and a constant pain, increased on pressure at the third and fourth dorsal spines. She died December 26, 1871, of caries of the vertebræ.

"Autopsy: calvarium dense and thick, tables thickened, diploë thin, membranes healthy, except some old adhesions on the left side, at the interior part.

"Brain appeared to be slightly shrunken, but the amount of serum which escaped was not sufficient to indicate any great general atrophy.

"On stripping off the dura mater on the left side, some slight adhesions were found between the layers of the arachnoid. These were easily detached, and exposed an excavation of the brain-substance at the postero-infero external part of the left frontal lobe. Its outline was irregular, its cavity filled with serum, and narrow white bands sprang from its sides. The serum was opalescent, but otherwise normal, and it was held in by the viscerae arachnoid. On emptying the cavity, its dimensions were found to be as follows: In its long axis, from before backward, parallel to the fissure of Sylvius, two and a quarter inches obliquely; vertically, one and three-sixteenths of an inch in its deepest part it was three-quarters of an inch, but generally only half an inch. This lesion had destroyed posteriorly the inferior fourth of the ascending parietal convolution, leaving a small posterior portion of the knuckle in which this gyrus ends; the inferior third of the ascending frontal, the inferior margin of the second frontal, and the *posterior half of the third frontal convolution* (Turner's inferior frontal), (Broca's). At the inferior margin there was a narrow ridge, of slight eminence,

which might have been the remains of the inferior border of the third. With these exceptions, the destruction of the posterior half of this convolution was complete, both as regards its gray and white matter. Its inferior boundary was the superior marginal convolution. The bottom seemed to be an anatomical limitation, as it was smooth, rounded, and presented no evidence of morbid action. Incision proved it to be the extra-ventricular nucleus of the corpus striatum. The edges of this lesion implicating the convolutions were ragged, which was suggestive of erosion, but there was no indication, by induration, softening, or thickening of the membranes, of inflammatory action."

Commenting upon this case, Drs. Tuke and Fraser remarked that there may be—1. Aphasia with a lesion; 2. Aphasia without a lesion; 3. A lesion without aphasia. "The first condition, aphasia with any brain-lesion, may be a mere coincidence of circumstances; that is to say, this affection may be but a simple concomitant of a lesion, not the direct result of it." They consider the association of aphasia with lesion of the left frontal lobe, however frequent, to be merely coincidence, and say: "We take up the position that nothing less than the never-failing association of aphasia with the lesion of the asserted seat, and never the lesion without the aphasia, can establish as a positive physiological fact that there is a locus for the faculty of language."

"The second condition, aphasia without a visible lesion, is by no means uncommon. Functional derangement of the whole or part of an organ causes symptoms and perversion of action as well as apparent pathological change. This condition does not logically damage either the 'cause and effect' or the 'coincident' theory, as the maintainer of the first may assert that the locus, although not pathologically changed, has been functionally out of order; while the holders of the second might reply that it is impossible to have such an aberration of faculty, if permanent, without some resultant organic and demonstrable change."

With regard to the third and most important condition, the writers consider that the post-mortem examination refutes to demonstration the theories of Broca and Ogle, for this was a lesion of the third left frontal convolution, *without aphasia ataxica*.

The commentary on this case is too long to reproduce here, but we recommend it to those interested in the question. We give a note upon it, kindly communicated by Dr. Broadbent, who says: "It is one of the rare undoubted cases in which the third left frontal convolution has been destroyed without aphasia, and it would be fatal to the hypothesis of a faculty of language there located, but looking upon the convolutions along the upper border of the fissure of Sylvius as a part of the efferent machinery for the transmission of the functional products of the superadded convolutions to the corpora striata, there to be translated into movements, the fact, that the third frontal gyrus of the left side is exceptionally found not to have been specialized as the outlet for intellectual expression, cannot neutralize the overwhelming evidence that it usually does form the "way out" for language. We do not know why the specialization of the apparatus for the expression of intellectual propositions takes place in *one* hemisphere only. We have

some comprehension why, since this is the case, the specialization should usually be in the left in Moxon's association of it with right-handedness, confirmed as this has been by aphasia with left hemiplegia in left-handed people; but, since the specialization is not dependent upon or due to any known anatomical difference between the two hemispheres, occasional deviations from the rule are to be expected, and constitute no real difficulty.

At a meeting of the Medico-Psychological Association, held in December last, Dr. Maudsley read a paper on the question, "Is Insanity on the Increase?" "The popular opinion," he says, "undoubtedly is, that insanity is increasing greatly in this country. The necessity, year after year, of enlarging county asylums and erecting new ones, and the continual cry for more accommodation, are facts sufficient to give much show of probability to the opinion. There are more insane persons shut up in asylums in this country now than there ever were at any other period of its history, or perhaps in any country at any period of the world's history. For the last twenty years, there has been an increase of upward of a thousand a year in the registered insane population of England and Wales. Whether any, and, if any, what proportion of this great increase is owing to an increase in the proportion of lunacy to the population, are questions more easily disputed than decided. There are plausible reasons why more persons should go mad now than in our grandfathers' days. The fast living and strain of eager competition are alleged; but the business of a man in the world is activity, and this is more calculated to preserve mental health than indolent stagnation. Statistics are against the dwellers in quiet rural and agricultural districts; the ratio per 1,000 in the county of Flint is 4.64; in the West Riding of Yorkshire it is 1.42. The rapid railway travelling of the present day has been said to be injurious to the brain, yet the countervailing advantages of railways must have been incalculable. More than any other single agency they have promoted human development. Passing by pure speculations, let us examine statistics. Before 1844, the statistical returns were too imperfect to be quoted, but in that year there were registered 20,611, or 1 in 802 of the population; on January 1, 1859, the total number was 36,762, a proportion of 1 in 535; in 1865, the number was 45,950, or 1 in 434 was insane; and on January 1, 1871, the total number was 56,755, or 1 in 400 was insane. A similar large increase has taken place in France.

"Now, there can be no difficulty in recognizing the main cause of this so great increase to lie in the successive regulations made for the better care of the insane. In England, the effect of the lunacy act of 1845, which enjoined on counties to build asylums in order to make suitable provision for their insane poor, was to swell largely the number of those registered. The effect of the opening of county asylums was not only to bring the insane under registration, so that they were known, but under proper care, so that their lives were prolonged; for there cannot be a doubt that the insane poor live longer now in county asylums than they did in their former neglected state. Take one only of the conditions of proper care—namely, a liberal diet—and we find that it exercises a material influence on the mortality. In Dr. Thur-

nam's valuable work on the 'Statistics of Insanity' there is an instructive comparison between the mortality of three asylums in which the diet was liberal, and that of four asylums in which it was poor and insufficient: in the former the mean annual mortality was 9.35 per cent., while in the latter it was as much as 14.54 per cent. Such facts hardly leave room to doubt that the mortality of the insane poor was much greater when they were insufficiently fed, badly clothed, and miserably housed, than it is now, when they are comfortably provided for in well-conducted asylums. To some extent the numbers have risen because they have not been kept down so much by death as formerly.

"It is certain that, since asylums have been open, there has been going steadily on an accumulation of those who do not die or are not discharged, which is sufficient to account for a considerable increase in the number of registered insane persons. While the discharges and deaths are fewer than the admissions, the numbers must of course progressively increase. In the year 1859, the admissions were 9,310, the discharges and deaths 8,452, leaving an accumulation of 858 insane persons; in the year 1860 there were left under treatment 1,130, and in the following year 1,380, and so in twelve years, from 1859 to 1870, there remained as many as 15,186 of the admitted cases. Of course, if the county asylums had been open, and the registration of lunatics sufficiently complete for more than a generation, this source of increase would exhaust itself, and this element in the calculation might be disregarded. It would be of no consequence whether the insane were accumulating in or out of asylums, so long as they were included in the returns. But, inasmuch as many of them living in villages and workhouses were not included in the returns formerly, who, having been gradually collected into asylums, and otherwise brought under knowledge and care, are included in the returns now, it is necessary to appreciate the influence of accumulation in swelling the total numbers of the insane.

"Another circumstance, which, as Dr. Robertson has pointed out, had the effect of considerably increasing the number of registered lunatics, was the passing of the lunacy act of 1853, which prescribed a quarterly return of pauper lunatics not in asylums, by the medical officers of the unions. Thus, in thirty large parishes and unions, only 408 pauper patients were returned as residing with friends in 1852, while in 1860 the number rose to 985. And this is to be explained by the more complete system of registration, for it is not to be believed that more lunatics reside with their friends now than were so residing twenty years ago.

"Thus, then, we find cogent reasons for concluding that the great increase in the number of insane persons now under care is to be accounted for by other causes than a steadily-increasing production of insanity. Those who would explain this increase by the latter theory, run the risk of proving too much; for, if the increased liability is to continue, the population of the county must, in time, be so largely infected that the sane people some day will be in a minority!

"Let us look now at the admissions of patients of all sorts during a series of years, as these will furnish better evidence of the number of

occurring cases of insanity than we can obtain from looking at the total number under care: From 1859 to 1870, inclusive, there were admitted, in each year, 9,310, 9,512, 9,329, 9,078, 8,914, 9,473, 10,424, 10,051, 10,631, 11,213, 11,194, 11,620. During the first six years, the numbers varied little, and certainly did not indicate a steady rise in the rate of the production of insanity. In 1865, however, the number suddenly mounted up nearly 1,000, and since then it has risen upward of 1,000 more. Now, a probable cause of this increase was the passing of an act in 1861 by which pauper lunatics were made chargeable upon the common fund of the union, instead of upon the parishes to which they belonged. The effect of this, so soon as its purport was realized, was to abolish all desire on the part of particular parishes to spare themselves expense by taking care of their harmless lunatics at home; the cost of asylum maintenance falling upon the common fund of the union. People now see lunacy in forms of imbecility and illness in which they would never at one time have dreamed of doing so, and the one idea of relieving and other parish officers, so soon as the word lunacy is mentioned, is the asylum.

"As showing the character of the admissions in the year 1865, when there was the sudden increase, I may point to the fact that the percentage of recoveries on the admissions for that year was evidently below the average; being for all classes of patients 31.56, against an average of 33.95 for the last twelve years. No wonder that complaints have arisen from the superintendents of county asylums who find their wards filled with cases which might well be taken care of elsewhere, to the exclusion of acute and curable cases. Whether the operation of the act of 1861 will account for the entire increase of admissions during the last six years it is impossible to say; but there can be no question that it has produced a considerable increase, and, but for its disturbing agency, the numbers would have been smaller.

"But there is another important consideration. The population in 1859 was 19,686,701; in 1871 it was 22,704,108. I have calculated the ratio of the admissions to the population for the last twelve years, and the results are:

In 1859, 1 in 2,114	In 1865, 1 in 2,013
" 1860, " 2,092	" 1866, " 2,111
" 1861, " 2,156	" 1867, " 2,015
" 1862, " 2,240	" 1868, " 1,930
" 1863, " 2,307	" 1869, " 1,953
" 1864, " 2,192	" 1870, " 1,901

"The ratio of the occurring cases of insanity to the population does not by any means look so formidable as the ratio of the total amount of insanity to the population. True it is that the table shows an increase, especially during the last three years, but is the difference between 1 in 2,092 in 1860, and 1 in 1,901 in 1870, greater than may be accounted for by the causes which have undoubtedly operated to swell the admissions?

"One consideration more, drawn from a regard to the distribution of insane patients: Of the total number of insane in 1859, 31,782

were pauper, and 4,980 private patients; in 1871 there were 50,185 paupers, and 6,110 private persons. The increase of private patients has been only 1,130—an increase which, having regard to the addition of 3,017,407 to the population, must be pronounced moderate, being at the rate of 1 in 2,670 of the actual increase of the population. And, looking at the admissions of all sorts of patients for the last twelve years, we find that the admissions in 1870 were actually fewer than they were in 1859, the numbers being, in 1859, 2,856, while in 1870 they were only 2,671. These figures afford no real support to the opinion that, so far as regards private patients, insanity has undergone an increase out of proportion to the increase in the population. They will appear more striking, when it is remembered that the more numerous and stronger causes of insanity which are supposed to be at work in these latter days would presumably operate upon the class from which private patients come, to at least as great an extent as upon the pauper class. Still it must be allowed that insanity is a pauperizing disease, and that many who, while in health of mind, are above the rank of paupers, are compelled, when struck with insanity, to fall into that rank. But this is a cause of pauper insanity which has been always at work.

“There is an interesting question in relation to the accumulation of insanity which I do not remember to have seen considered. Do as many insane persons, of those who yearly become so, recover now, as formerly? We have seen that the mortality is less; but it would be instructive to ascertain if the humane system of treatment, and the aggregation in asylums, have increased the number of recoveries. There is no proof of such a happy effect. Dr. Thurnam, writing in 1845, and dealing with asylums under the old dispensation, states that in asylums that have been established during any considerable period—say twenty years—a proportion of much less than forty per cent. of recoveries among those admitted is to be regarded as a low average, and one much exceeding forty-five as high. In the last report of the commissioners in lunacy, the average proportion of recoveries of all classes of patients to the admissions was, from 1859 to 1870, 33.95 per cent.; the proportion for county and borough asylums, 35.61 per cent., a considerably lower proportion than under the bad state of affairs before 1845. No wonder the number of the insane has increased. Probably this low percentage of recoveries is due, not to the ill-success of the present mode of treatment, but in a great measure, if not entirely, to the hopeless character of the disease in most of those admitted during the last twenty-five years, a greater proportion of acute cases having been admitted prior to 1845.”

The conclusions to be derived from the foregoing considerations, Dr. Maudsley sums up as follows:

“1. There is no satisfactory evidence of an increase in the proportion of occurring cases of insanity to the population; and no evidence, therefore of an increased liability to insanity.

“2. It is not necessary to assume such an increase in order to account for the undoubted great increase in the number of registered insane persons.

“3. The difference between one insane person in 812 of the popu.

lation in 1844, and one in 400 in 1870, is mainly, if not entirely, owing to the fact that in the former year the returns included only half the existing insane persons in the country, while in the latter year nearly all of them have been registered.

"4. Some part of the difference is owing to the fact that certain patients are registered as lunatics now, who would never have been thought so in times past.

"5. A lower rate of mortality and a lower percentage of recoveries may account for a part of the increase in the total amount of insanity.

"6. The proportion of admissions to the population, which represents approximatively the occurring cases of insanity does not, when the necessary allowances are made, yield evidence of any serious increase."

Dr. Arthur Mitchell continues, in the *Edinburgh Medical Journal*, his lectures on insanity, and considers the subject of Sympathetic Insanity, the Influence of the Body on the Mind, and the Mind on the Body. He reminds his readers, at the commencement, of the eccentric causes of epilepsy, eccentric irritations, due to dentition, worms in the intestine, excess of venery, the establishment of the menstrual discharge, and other similar causes. According to Reynolds and Brown-Séquard, this is an exceedingly common cause of epilepsy, and a striking case is given, which is related by Dr. Morgan, and happened in the practice of Mr. Standert, of Taunton: "A boy of fourteen, on getting out of bed in the morning, became violently agitated, spoke incoherently, and broke the furniture. He was put into bed again, when he at once became composed and rational. He remained in this state till Mr. Standert visited him, about five hours after the attack. He was then calm and cheerful, and there was no sign of any bodily disorder. He said he felt quite well, and wished to get up, and he was permitted to do so; but, on putting his feet on the floor and standing up, his countenance became instantly changed, his face became convulsed, and he was about to become unmanageable and destructive. Replaced in bed again, he was at once calm, though he looked surprised, and asked what was the matter. Nothing had ever occurred in his history to indicate a tendency to such attacks. He had been fishing the day before, and had been wading barefoot. His legs and feet were therefore examined, but no scratch or injury was found. On lifting the foot, however, to examine the sole, by the right great-toe, which was thus caught and pressed between the forefinger and thumb, the muscles of the jaws were again suddenly convulsed; on releasing the toe, these effects immediately ceased. The toe was then closely examined, and on the bulb, nearly where the circumgyrations centre, there was found a very small elevation, as if a bit of gravel had got under the cuticle. There was no redness, however, nor sign of inflammation; but, on pressing this point between the finger and thumb, and against the nail of the toe, a slight convulsion instantly ensued. The boy said that he had no pain, but that it made him feel very odd. No scratch or puncture of the cuticle at the seat of the little elevation could be detected, but it was snipped off, in the expectation of finding the point of a thorn, or a grain of sand. Nothing of the kind, however, was found. But the toe could now be

pressed without injury. The strange sensation was gone, and never returned."

"Turning from epilepsy to tetanus, we find in the traumatic variety, which is in this country by far the most common, that nearly every case is strikingly referable to an eccentric origin. The most trifling injury may cause it, nor is an inflammatory condition of the wound essential: it may be almost healed and forgotten. In this disturbance of nervous action, the mind may, and generally perhaps does, remain clear, from the beginning to the end. In epilepsy, the cerebrum is the seat of the disorder. In tetanus, it is the spinal cord.

"Passing to chorea, which has been called an insanity of the muscles, we shall find that of it also there is a form which has been designated eccentric. Marshall Hall regards much of chorea as having this origin.

"It appears, therefore, that we have not one form, but various forms of disordered action in the muscles, due to eccentric irritation. But there are not only a reflex excess and waywardness of action in the muscles. There are also a reflex loss of power, a reflex paralysis, a reflex paraplegia. Brown-Séquard thinks that there are two modes of reflex action by which eccentric irritations may produce paraplegia: 1. By contraction of the blood-vessels in the cord, in the motor nerves, or in the muscles themselves; 2. By a reflex influence on nutrition."

"We have disturbances of the mind resulting from eccentric irritations in the body, just as we have disturbances in the muscles. We have also different kinds of mental, as we have different kinds of muscular disturbance with this origin. We have in mania and fatuity something like the analogues of convulsions and paralysis, and we have them arising from similar causes. This, in fact, is what is meant when we speak of sympathetic or reflex insanity, the story of whose production is so like that of the neurosis to which I have referred that we cannot escape from seeing the close alliance which exists between them.

"I shall begin by noticing a phenomenon familiar to all. Man is said to be the only animal that laughs. Laughter expresses in children a pleasurable state of mind. In later life, most of our laughter occurs when the mind catches sight of some incongruity in objects, thoughts, or words; but in adult, as in early life, laughter indicates a pleasurable state of mind. Laughter, therefore, usually follows a certain state of mental action; that is, certain mental operations cause the bodily phenomena which we call laughter. But we can reverse the process, and, by acting on the body, we can call up both the pleasurable state of mind and the phenomena of laughter. What else happens when the sole of the foot is tickled? Here we have a trifling irritation, as far as it well can be from the great nervous centres, producing a particular state of mind, and also producing those bodily phenomena which often follow that state of mind, when it is otherwise induced.

"There are two points to which I would refer. Is it not the case that some are provoked to laughter much more easily than others, by

tickling the foot or the armpit? How do these differences occur? If I accounted for them by degrees of mobility and stability in the nervous system, I should still have to explain what this means; a task, I fear, which I should fail to accomplish satisfactorily. Yet I think all will agree that, when we speak of a mobile and unstable state of the nervous system, the words call up to the mind a state with which we feel familiar, and which we think we can recognize. When our knowledge is deeper, perhaps we may use other and more definite words in speaking of it; meanwhile it is sufficient if I succeed in indicating one of the recognizable states of preparation for being *easily* or *not easily* acted on by such irritations as that under notice.

"Secondly, what would happen if the tickling were persisted in? I have no facts enabling me to answer this, but I think I am justified in asserting that the facts might be serious. In adults, the laughter cannot be so readily kept up as in children, but it can be sufficiently prolonged to cause the pleasurable feelings to give place to feelings of distress or even pain, referable not to the foot, but to the head. We may assume that changes of nutrition will occur in those parts of the nervous centres which are excited into such lively action, if it be prolonged, and that the functions of those parts will thereby be modified, while other parts may at the same time be called into abnormal action.

"I shall proceed now to show that we meet, in actual practice, many cases of insanity which we believe to be due to these eccentric irritations, and that the lesions they inflict on the mind are not less grave and not less frequent than those we found them inflicting on the body, when we spoke of epilepsy, tetanus, chorea, and paraplegia."

Dr. Mitchell first speaks of that sympathetic insanity in which the eccentric irritation lies in the colon, and which has been brought into prominence by the late Schroeder van der Kolk: "In the insanity which comes from this source, there is almost invariably a depressed or melancholic state of mind; but, more than this, the depression has certain characters which tend to distinguish it from depressions due to other causes. In melancholic persons whose mental disorder proceeds from some eccentric irritation in the colon, along with the general feelings of depression, sadness, and gloom, there are engrossing self-accusations of wickedness and baseness, either in the present or in some past time. They persistently calumniate themselves. They regard their fits of sadness as qualms of conscience. They have rendered their relations or friends miserable, or have plunged them into poverty. They have been cheaters, speculators, and have used money which did not belong to them. They have shown a wicked want of affection toward parents, wives, or children; they are the cause of other people's sorrows, sufferings, and losses, and are waiting to be punished; they must not eat, because they have wasted their money, and have none left to pay for food; they have deservedly fallen into contempt, and so on. In short, they are depressed and sad, and they say they are so because conscience is awakened in them to a sense of their great wickedness, and they are accordingly loud and unceasing in their self-accusations.

"So much for the mental signs. As regards the bodily, there may be a good appetite, but it is generally bad, with a foul breath, and food is sometimes altogether refused. The hands and feet are cold, and the pulse small and contracted. There is sleeplessness, sometimes almost complete. Even when such patients sleep, after going to bed, they waken early, and in the morning their state is generally one of greater misery and wretchedness than toward evening, as indeed is the case with most melancholics. In not a few instances, pressure on the upper part of the neck causes an unpleasant feeling in the head. Lastly, there is in every case marked constipation, and, in most cases, this long precedes the mental derangement."

These symptoms Van der Kolk believed to be associated with states of the colon: "The descending colon is believed to be the suffering part, in the first instance. Constrictions or narrowings occur in it, of a spasmodic or organic nature, either above or immediately below the sigmoid flexure. When below, the flexure itself is distended with gas, and widened, lengthened, and often pushed up to the transverse colon. When above the flexure, then the transverse colon is distended, widened, and lengthened, so as often to fall down to the pelvis. These changes and displacements may in some cases involve both the descending and transverse colon, but the narrowings or constrictions have not been observed either in the ascending or transverse paths of the gut. Van der Kolk thought that these displacements and elongations of the colon arose from previous spasmodic contractions and strictures of the left portion, and that constipation in the first instance leads to these, which in their turn mechanically increase the constipation. And so the gut just above the stricture becomes filled with hardened fecal masses, while the rest of the gut, back even to the cæcum, is more or less permanently distended with gas. The presence of these fecal masses at the seat of the constriction is supposed to cause the irritation, which acts sympathetically and injuriously on the brain, and gives rise there to the peculiar morbid action which has been described."

Dr. Mitchell attaches a high importance to these irritations of the colon, and thinks that, if ever medicine is to be of much use in averting and curing insanity, one of the ways, by which this usefulness will be attained, lies in the careful study of the effects on the brain of eccentric and removable irritations such as these. He gives the case of a gentleman, who consulted a physician for great depression of spirits, stating that he had committed abominable wickednesses, that he deserved some terrible punishment, and that life was unendurable. An aperient was ordered, and acted well, but he was no better; another also acted well, but with little relief to his distress. A third brought away a very copious discharge of hardened fecal masses. Immediate and almost complete relief to the mental symptoms followed, and there was no return. "It must not be expected, however, that we shall often have a good result so quickly or satisfactorily as in this case, for, where the sympathetic irritation of the brain has lasted for any length of time, its nutrition will have been so affected, and such changes will have occurred in it, that we cannot look

for an immediate relief, when the eccentric irritation, which has really originated the mischief, is withdrawn.

"There is, besides, an unhealthy action of the mind, of a minor and less serious character, which attends what we call an overloaded state of bowels. Obstinate constipation makes men irritable, depressed, dissatisfied with themselves, and incapable of seeing any but the dark side of events. This is a minor manifestation of what has been described as insanity or melancholia."

Dr. Mitchell also mentions a sympathetic insanity, "due to an irritation in the gullet, in which the mental phenomena are as unlike as they can be to those believed to be produced by cerebral sympathy with irritation in the colon. The *ascaris lumbricoides* occasionally penetrates to the œsophagus, and, when it does, is not readily dislodged. It appears to be tolerably well established, that its presence there occasionally produces an irritation, which may be reflected to the brain, and may cause mental derangement. It is probable, of course, that so serious a result will only occur in persons with unstable nervous systems, and predisposed by heredity, or by some other cause, to cerebral disease.

"Morel says that the brain is always the seat of the insanity, though it is not always the seat of the cause. By this he meant that insanity may be determined by a sympathy of the brain with morbid action in some remote part of the body. That this often happens, we have already shown, but Dr. Maudsley points out that the centre of morbid irritation, which gives rise to secondary disorder by reflex or sympathetic action need not of necessity be in a distant organ; it may be in the brain itself. Thus he says: 'A tumor, abscess, or local softening in the brain, may nowise interfere with the mental operations at one time, while at another it produces the gravest disorder of them; and it is not uncommon, in abscess of the brain, for the symptoms of mental derangement, when there are any, to disappear entirely for a time, and then to return suddenly in all their gravity.' That is, there may be a secondary and sudden derangement or abolition of function by sympathetic or reflex action. 'Instances now and then occur, in which a sudden loss of consciousness, or a sudden incoherence or sudden mania, or even sudden death, takes place, where no premonitory symptoms have indicated grave local disease of the brain,' though grave disease existed.

"I direct attention to this form of reflex insanity, because I think it probable that cases will occur to many of my readers, which cannot be satisfactorily explained, except on some such theory as that ingeniously advanced by Dr. Maudsley.

"It is necessary, for this view, to look on the tumor, or abscess, as external to the brain, though within the skull. In epilepsy caused by tumors or osseous deposits within the skull, the fits are often probably determined in this way. It may be difficult to explain why, in such circumstances, fits suddenly occur, and why all is right in the intervals; why, on the contrary, there are not continuing convulsions, the tumor or spiculum of bone being always there. We know, however, that there are unceasing changes in the circulation of the blood in the

brain as regards quantity, quality, and distribution; in other words, the conditions are liable to important variations, and perhaps this may be sufficient, in some way, to account for the sudden fits of sympathetic disturbance to which allusion has been made. Whatever be their explanation, however, the phenomena are not more remarkable than that an unextracted bullet should at times cause great and at times no suffering.

"One lesson we learn from these excessive derangements of the mind, which come suddenly, and pass away quickly and completely, namely, that great functional disorders of the brain are possible without structural changes in it, for it is impossible that these last—the structural changes—could come and go with the appearance and disappearance of the abnormal mental phenomena.

"In many of the morbid conditions discussed, it is seen that particular trains of mental symptoms resulted from particular bodily states. In insanity which springs from irritation in remote organs, the delusions have sometimes a close relation to the functions of those organs; the sexual hallucinations which often present themselves when the irritation lies in the ovaries are an illustration of this. But such relations of mental to bodily states of disease are equally interesting when they are not associated with the functions of the organs in which the eccentric irritations exist. They are scarcely less so when it is doubtful whether they are properly due to eccentric irritation, and do not rather originate in primary disorder of the brain, the definite signs of bodily disease being perhaps a sequence."

In general paralytic patients of the typical kind, we find certain definite and constant bodily symptoms, associated with certain definite and constant mental symptoms. So in consumptive patients, their inability to realize their fate is very striking. "This is nothing but a low form of that mental state which is seen so strongly in the general paralytic. Whether the consumptive's state of mind arises from the fact, as Sir Thomas Browne says, that they feel not themselves dying, and therefore still hope to live, or whether it is a mere phase of the heightened mental activity which is believed to belong to scrofulosis, I cannot tell; but the last is the more probable explanation. This activity of the cerebral centre, due to scrofulosis, is seen in the liveliness and precocity of scrofulous children; and many observers think that it takes special and æsthetic directions in the adult. Thus, Dr. Macartney says: 'There is a mental character belonging to the scrofulous habit, which more strikingly denotes the peculiar state of the constitution than all other signs. Scrofulous persons in general exhibit little mental energy, but a gentleness and amiability of disposition, a refinement and judgment in matters of taste, and a purity of moral feeling, which are sometimes so remarkable as to place them in these points beyond the scale, and even beyond the conception of the mass of mankind.' On all hands, indeed, we meet with these minor displays of a steady alteration in mental action, as the result of particular bodily states. The psychical longings of pregnant women, for instance, furnish another good illustration.

"Who, again, does not recognize phenomena of an exactly com-

parable character, in the shyness, the evasive and cast-down look, the dull, irresolute character, the conceited self-consciousness of the masturbator; in the religious color which irritation in the sexual organs gives to melancholia; in the peevish, egotistic, uncertain, and depressed state of mind, which attends indigestion; in the hypochondriac's selfish regard to his own health, his dwelling on trifles, his wavering emotions and resolutions, his timorousness and strange fancies? Are we not all aware of the great change of character which follows the physical changes constituting puberty? From the intellectual indolence of a young girl, do we not infer that sexual development is being retarded, and from expressions of fantastic sentimentality, that it is commencing?

"What passes in the economy, to explain all these connections and interminglings of body and mind, I cannot tell. We may have an ovarian tumor of enormous size, with no apparent influence on mental action, while a trifling irritation in the ovary may send the patient to an asylum, just as a man may have his hand shattered in the most formidable manner, without having tetanus as a consequence, though a trifling cut on his finger may induce that disease. It is of importance to keep this in mind, that we may avoid the error of dismissing the consideration of any alleged cause, on the ground of its seeming insufficiency."

Dr. Mitchell refers to other states, illustrating the intermingling and interdependence of body and mind, such as dizziness, a state of mental confusion. "The sensation of a buoyant undulation, or swimming, is soon passed in persons whose nervous constitution is weak and mobile; and there comes, then, a state of mental confusion, with delusions of sight and hearing, which may end in syncope and loss of consciousness."

The mind may be influenced through the senses, and definite mental results may arise from irritations produced by such soft and subtle agencies as waves of light, or waves of sound, or impalpable odors, on the peripheral expansions of nerves; insane delusions and spectral appearances may grow out of disorders of the eyes.

"So, again, the mental phenomena which result from intoxication by various substances are not the same. These phenomena have not been studied with the attention they merit; but it is acknowledged that, in the intoxication produced by alcohol, belladonna, opium, or cannabis Indica, the mental states differ greatly, and that the character of these differences may be called constant.

"The delirium of the exanthemata is, in some measure, of the nature of an intoxication. It is something more than such a delirium as attends a local inflammation with high fever. There is a difference between the delirium of scarlet fever, and that of typhus, measles, or small-pox. No one, however, so far as I am aware, has attempted to describe the characters which these toxic agents respectively impress on the delirium which they may produce.

Dr. Mitchell then proceeds to make some observations on the influence of the mind on body, illustrating them by reference to the

phenomena of blushing, the shiver and stammer of fear, and other like emotional displays.

Dr. Crichton Browne, the superintendent of the West Riding Asylum, has done good service in trying the effect of various remedies upon the patients who come under his care in such large numbers. In the *Lancet* of February, 1872, he has given us his experience of conium in the treatment of acute mania. He differs from Dr. Maudsley in the opinion he holds with regard to the value of sedatives, and says that they are still all but universally employed in lunatic-asylum practice, and have not as yet forfeited in any degree the confidence of those who are most familiar with them. In a number of investigations, having for their object the discovery of some principles by which the choice of sedatives in cases of excitement might be guided, I have been led to the conclusion that conium—a very old remedy, with a good modern reputation—is the sedative, alone or in combination, which, above all others, is best suited for that variety of excitement which we call acute mania. A remark of Dr. Harley's, in his admirable work on the "Old Vegetable Neurotics," first suggested to me that mania might be favorably influenced by that drug. As, however, the earliest experiments with it were, from certain causes, barren of results, I imagined that Dr. Harley was mistaken, that conium only acted on the motor centres, and that the cerebral hemispheres were beyond its reach. Reconsidering the matter, however, and investigating the properties of conium with greater care, I came to the conclusion that it is most beneficial in mania, and that it is so by virtue of that action on the motor centres which Drs. Harley, Bennett, and others, have demonstrated. Motor excitement is an important and constant element in mania: the rapid movements tend by their nature and physiological concomitants to excite the cerebral hemispheres and involve the mental functions. The best descriptions of the disease dwell on the extraordinary mobility which characterizes it. In several cases in which death has ensued from the exhaustion of mania, I have observed that the corpora striata have participated in that appearance of vinous staining or purple, blotchy discoloration, which is occasionally observed in the cortical structures and adjoining medullary substance.

"If, then, muscular tranquillity can be insured in mania, there is good ground for hoping that mental calmness will speedily follow. Conium soothes and refreshes the irritated or exhausted centres of motor activity, exerting a powerful control over the corpora striata and whole motor tract. Dr. Harley's investigations show that the earliest physiological effects of conium are—sensations of weight and weariness in the legs, dimness of vision from impaired power in the muscles of the eyeball, general languor, and, when given in full doses, prostration of strength, and complete muscular repose, merging into paralysis. These physiological actions of conium indicate that it is upon the motor tract that its influence is first exerted.

"Its virtues have been abundantly shown in trials made in the West Riding Asylum. When first employed, the experiments were nugatory, because the preparation used was inert, and the doses insuffi-

cient. Since February 23, 1871, up to November 1st, twenty-eight cases of mania, twenty-five of acute mania, and three of acute delirious mania, have been treated from the first with succus conii, the only preparation which can be employed with confidence. Of the twenty-five cases of acute mania, twenty-three have, prior to January 1, 1872, been discharged, recovered; one, a woman, has relapsed, and one, a man, is still maniacal, but improving. Of the three cases of acute delirious mania, one recovered, one is improving steadily, and the third died, having been admitted in a sinking state. The conium was not given to selected cases, but to every case of acute mania admitted after the date mentioned. "With the view of determining the relative duration of cases of acute mania treated with conium, and with other remedies, I have contrasted twelve cases from each category. As the result of that contrast, I find that twelve consecutive cases, treated from the first with conium, admitted subsequent to February 25, 1871, and since discharged, recovered, had an average duration, as measured by residence in the asylum, of one hundred and two days; whereas, twelve consecutive cases treated with other remedies, such as bromide of potassium, cannabis Indica, chloral, and digitalis, admitted subsequent to October 1, 1870, and since discharged, recovered, had an average duration, as measured by residence in the asylum, of one hundred and fifty days. This shows a balance of forty-eight days in favor of conium. When conium was used, that period of convalescence which it is thought prudent to interpose between the date when recovery might be called complete, and the date of discharge from the asylum, was in no instance unusually shortened. In some cases it might be thought that it was unnecessarily prolonged. So rapid and decisive were the beneficial effects of the remedy, that it was feared at first they might prove transitory, and that, as is not seldom the case when recovery is sudden, a relapse might be looked for. Experience having now taught that this fear is groundless, a considerable curtailment of the term of medical supervision may be henceforth safely conceded. Indeed, so prompt is recovery, as a rule, under the conium-treatment, that it appears that the necessity of removal to an asylum may be obviated in some cases of acute mania, if it is had recourse to, and judiciously conducted, in their initial stage.

"The curative effects of conium in acute mania are not limited to those cases in which that remedy is used from the outset of the disorder. Eight patients in this asylum, in whom other methods of treatment had been first employed, have derived marked advantage from the substitution of conium for other drugs. To secure the benefits of this treatment two conditions must be observed: 1. The preparation must be good and active; 2. The dose must be adequate in amount. The succus varies in activity in an extraordinary degree—some of it is absolutely inert; as a rule, I have commenced with two drachms for a woman and three for a man, and have rapidly increased the dose till I have noticed some cessation of restlessness or signs of lassitude or weakness of the limbs."

It is to be hoped that the treatment of acute mania by means of

conium, as advocated by Dr. Browne, will have an extended trial, and that we shall gather from various quarters the result of such treatment. Dr. Browne also as strongly recommends the administration of the Calabar bean, *Physostigma venenosum*, in general paralysis, and tells us that he has employed it with marked benefit in those attacks of excitement which check the course of this disease, and which have hitherto been so intractable. In these, as well as in some other forms of organic cerebral disease, the extract of physostigma, in doses varying from a quarter of a grain to a grain, had a rapid and powerful calmative action. Excitement and muscular tremor abated under its use, and some degree of general and permanent improvement followed. The action of the neurotic remedy might be due to its power of diminishing excitability, or to its action upon the tension and calibre of vessels, aided by its sedative influence on the heart.

Dr. S. W. D. Williams, the superintendent of the Sussex Asylum, has also made trial of the Calabar bean in cases of epilepsy and progressive paralysis, being struck by Dr. Fraser's conjectures as to its special power over the spinal cord, and its capability of destroying reflex action and paralyzing the heart. He chose twelve ordinary epileptics, and noted the number of fits daily for six months. All were then weighed, and commenced taking one grain of the bean each twice daily. This was continued for six months; they were weighed every month and the dose of bean was increased a half grain at a time, till the sixth month, when they each took three and a half grains twice daily. All medicine was then omitted, and the number of fits registered for another six months. Dr. Williams gives a table of these registers, from which it appears that in six of the cases there was a very considerable decrease in the number of fits during the six months the patients were taking the bean, as compared with the six months previous; and, what is still more remarkable, when the bean was omitted, the fits, without exception, began to increase again in every case. Thus C. A. had one hundred and ninety-four fits during the first six months, and only one hundred and twenty-six while taking the medicine; but they increased to one hundred and thirty-five in the following six months when it was omitted. In the other six cases there was a slight increase in the number of fits during the administration of the drug, but this increase was not nearly so great as the diminution in the other cases, neither was there the same tendency to return to the former numbers after the drug was omitted. From the table of weights we learn that seven increased in weight while taking the drug, four lost, and one was stationary. Out of six patients whose fits were lessened, three lost weight; of those who were not benefited, only one lost weight. "Therefore, I fear that the only fact these observations as to weight prove is, that, as a rule, the Calabar bean given in doses up to seven grains a day does not interfere with the nutrition processes, at all events, materially. If, in truth, the Calabar bean has any influence in epilepsy, I cannot but think that its power must lie in the fact conclusively shown by Dr. Fraser, which my own observations abundantly bear out—that even in moderate doses it causes a decrease in the volume and frequency of the pulse, acting of course through the heart. In this

property it resembles the bromide of potassium. Now, the best authorities seem to agree that the proximate cause of epilepsy is exaggeration of the impressibility and increased irritability of the motor excitability of the functions of the medulla oblongata. This must be due to malnutritive changes in the organ, and would therefore lead us to suppose that any power acting through the heart and reducing the flow of the excess of blood would lessen the number of fits, by the mere fact of there being less deleterious matter stored up in the medulla; granted this, and the decrease in the number of fits by the Calabar bean is explained.

"I have also tried this drug in several cases of *progressive paralysis of the insane*, and at the present time have three such cases under treatment. When the medicine was first ordered, fully six months ago, all the patients were in the first stage of the disease, and they have taken it regularly up to the present time, but with no benefit whatever; on the contrary, in every case the disease is advancing with unusually rapid strides."¹

In the fifth volume of the St. George's Hospital Reports, Dr. Fuller records his experience of the use of Calabar bean in chorea, which he says has not confirmed the newly-acquired reputation of the drug in this disorder. "I gave the bean in the form of tincture in seven consecutive cases, which were all of average severity. The drug was administered alone, the dose at the commencement being m_x of the tincture (3j of the powdered bean in 3j of rectified spirit) mixed with an ounce and a half of water. This was usually given three times, but in two instances four times, a day, and the dose was increased gradually but rapidly, usually by about m_v every second day, until a point was reached at which the characteristic poisonous effects of the bean began to manifest themselves. The pulse became accelerated, feverishness supervened, loss of appetite and vomiting ensued, and uneasy sensations in the head were complained of. A drachm and a half or two drachms of the tincture, taken three times a day, usually sufficed to induce these symptoms. Beyond this, however, no appreciable effect was observed. There was no evidence of the cumulative action of the drug; the drug did not appear to influence the secretions; it did not materially affect the pupils, and it certainly did not exercise the slightest influence over the disease. Thus I am forced to the conclusion that, whatever other claims the physostigma may have to be regarded as a valuable internal remedy, it has none as a curative agent in chorea; and that the improvement which was observed to follow its administration, in the two or three cases previously recorded, resulted probably from the careful regulation of the diet and general improvement of the health which accompanied the patient's residence in hospital."

Ergot of rye is another drug which Dr. Crichton Browne has used largely in the treatment of certain forms of insanity. As conium is, in his opinion, of great service in the acute forms of mania, and Calabar bean in general paralysis, so ergot of rye is his sheet-anchor in recurrent mania, chronic mania with lucid intervals, and epileptic mania.

¹ *Practitioner*, February, 1872,

His reasons for its peculiar applicability in these cases he gives at length: "A remark of Brown-Séquard's, imputing to this drug the power of producing contraction in the vessels of the spinal cord, suggested to me, at the time which I have stated, the possibility that it might possess a similar control over the vessels of the brain, and might thus be made to modify the functional activity of that organ." The mode in which ergot puts forth its influence over the contractile coats of the vessels has not been clearly made out. There is some reason to suspect, however, that it exerts a direct action upon the non-striated fibres and cells contained in their coats. Ergot would seem to have a special power over involuntary muscular tissue. Its action on the uterus requires only to be mentioned. When injected into a vein, it depresses the action of the heart. These actions of ergot cannot be fairly referred to an influence on the vaso-motor or sympathetic system of nerves, but are all easily explicable on the supposition that it has an immediate effect upon the non-striated muscular fibres.

"I have said that the beneficial effects of ergot in certain forms of mental disease are to be attributed to its controlling power over the intracranial vessels, and I have adduced several facts in confirmation and explanation of that statement. I believe, however, that its best corroboration is derived from the phenomena of these cases themselves. In two hundred cases of insanity in which I have employed ergot, I have found it useful in none in which the theory of its action which I have suggested was not available. In recurrent mania, in chronic mania with lucid intervals, and in epileptic mania, it is of course certain that the morbid condition upon which the mania depends is of a dynamical and not of an organic kind, while it is probable that the morbid condition consists essentially in cerebral hyperæmia. Notwithstanding the manifest diversities of the three disorders named, it is still probable, nay, more than probable, that they all depend upon cerebral hyperæmia. For we must bear in mind that cerebral hyperæmia is not one constant condition, uniform in its symptoms and progress, but rather one pathological basis for a variety of irreconcilable conditions. The symptoms by which cerebral hyperæmia is accompanied vary greatly. They may appear as maniacal fury when the brain-substance is exhausted and irritable, in stupor when it is degenerated and enfeebled, or in vivacity and mobility where it is in vigorous health. Confusion of thought, despondency, moral obliquity, headache, sickness, or coma, may each of them result from an excess of blood within the cranium, according to the experiences of the nervous matter and the amount of the excess." We quite agree with this, but then we should expect ergot of rye to exercise a beneficial influence over other cases besides those enumerated by Dr. Browne. In the fury of acute delirium, which is often of so transitory a character that in a day or two the attack has passed away, and the sufferer is well, we should certainly hope that a drug which so powerfully affects the hyperæmic state of the brain would benefit the patient at once, but it does not appear, from what Dr. Browne says, that it has any influence in these cases. And yet the good effects he describes were witnessed in the acute stage of the recurrent insanity. The ergot was not given in the

interval between the paroxysms, but in the paroxysm itself. "In the last three paroxysms ergot has been given, and has arrested each of them in its incipient stage." Similarly he has given it in the maniacal paroxysm following epilepsy, not in the interval between epileptic attacks. Why, then, has it no effect in primary attacks of acute insanity? Are the non-striated fibres of the arterial coats not concerned with the last-named disorder?

At the Sussex Asylum Dr. Williams has also made trial of the ergot of rye, but the result in his hands was not so favorable as that reported by Dr. Crichton Browne. In his report for the year 1871, he says: "Dr. Browne has especially recommended it in those cases where there appears to be fulness of the cerebral blood-vessels, and also where a tendency to periodic attacks of maniacal excitement occurs. He believes that the drug has the power of relieving the former, shortening the duration of the relapses, and also lengthening the intervals between the periodic attacks. But though the cases were such as he describes as being specially influenced by the drug, we did not find any remarkable effects result from its use. Therefore, our experience leads us to believe that ergot has in itself no specific action in controlling the maniacal outbreaks of the insane. We were led to acknowledge its failure unwillingly, for, from some apparent success in the earlier observations, it was hoped that it would be found of valuable service. But, as repeated trials only demonstrated more and more its entire uselessness, we were compelled to lay it aside, and turn to more potent remedies.

"We employed several preparations of the drug, as the infusion, decoction, tincture, a modification of the tincture and infusion, the liquid extract, and combinations of these various preparations. Lastly, we took the precaution of obtaining the ergot from different wholesale houses, lest the quality of the drug should vary according to the vendor. We commenced the experiments on ourselves, the writer having repeatedly taken it, even in considerable doses, but nothing like 'colicky pain in the stomach or bowels,' nor any amount of mental depression or somnolence, was experienced. Once, however, after a dose of forty minims of the liquid extract, a peculiar tingling in the fingers, singing in the ears, and a sensation of lassitude, seemed to supervene. These symptoms were, however, probably due to the expectancy of some such arising, for, as confidence in the inertness of the drug asserted itself, so these sensations were no longer observed, even from increased doses. The pulse and temperature were taken both immediately before and after each dose, as well as some short time subsequently, but no change whatever took place in either.

"During our experiments on the patients, we carefully avoided the use of any other drug whatever, such as bromide of potassium, morphia, etc., so that the ergot might have a fair trial on its own merits alone."

We have mentioned these results as given by Drs. Browne and Williams, because it would appear from them that there is need of further investigations in the use of ergot of rye, and these we trust will be carried out in various asylums. Hitherto, in the treatment of insanity, the number of drugs which have been brought into action has been singularly small. It is much to be desired that investigations properly

conducted should be made as to the properties of others, and those who have to treat many recent and acute cases will, it is to be hoped, give a careful trial to such as seem likely to be of benefit to their patients.

I may mention a case communicated to me by Dr. Anstie, who has recently employed ergot of rye with success in various neuralgias after the recommendation of Woakes and others. The patient, a gentleman, aged fifty-six, has been the subject of gastralgia for several years, which had only been palliated by the regular use of hypodermic morphia. He was desired, on the occurrence of a really severe paroxysm, at once to stop it by a sufficient injection of morphia, but never to employ this remedy for the slighter attacks; and in the mean time he was given tincture of ergot in increasing doses for three or four weeks, so that at last he was taking fifty minims three times a day. At the end of this time, the strength of the tendency to recurrent pain was evidently broken; but, as the patient felt considerably depressed, it was not thought advisable to continue the ergot. But it may fairly be said that the case gave no further trouble. A slight "nervous storm," to use the patient's own expression, occasionally passes over him, accompanied with irritability of the stomach and bowels. This is easily quieted by a few small doses of the mild opiate called "nepenthe," and infusion of calumba. At present he has not needed the injection of morphia, since more than a fortnight ago. Sleeplessness and some minor nervous troubles are easily overcome by bromide of potassium. Dr. Anstie proposes to give the ergot in an entirely empiric manner for neuralgia. He does not consider that it does good by effecting any contraction of blood-vessels, for he has seen it do good in cases in which no supposition of a congestive state could be admitted. He believes the ergot has some other influence on the nerve-centres, not as yet understood.

Latterly, the nitrite of amyl has been recommended by several practitioners for the treatment of angina pectoris, asthma, and neuralgia. In the same report from which I have already quoted, Dr. Williams gives us an account of some experiments which he has made of its effect in epilepsy. Acting on a suggestion of Dr. Talfourd Jones, "he tried it in seven cases of epilepsy, representing altogether twenty-three fits, and had some reason to feel satisfied with the trials; so much so, that he is now engaged in making more numerous and accurate observations, which he hopes to publish in a future number of these reports.

"With two exceptions out of the seven cases, the second stage of the fit was shorter than usual, and far less severe, the clonic spasms being apparently controlled by the amyl. The face was nearly always paler, and rarely showed that congested, horrible appearance, familiar to all asylum physicians, while the flushing, so commonly noticed after inhalation of amyl in other diseases, was present here in one case only, and this was one of the cases in which no mitigation was observed. The rapidity of the circulation was in no instance diminished; indeed, it sometimes was quicker than usual, but there was seldom that throbbing, labored pulse which is considered so characteristic of epileptic convulsions. The pupils were not perceptibly affected.

"It would appear from the above that the nitrite of amyl possesses the power of shortening the second, and consequently also the third stage of an epileptic seizure, at least in the majority of instances, though the above cases are of course too few from which to establish any very reliable inferences. It is almost impossible to try its real or supposed preventive powers in a lunatic asylum, as the insane rarely or never complain of the epileptic aura, or of any other premonitory symptom of an approaching fit.

"The inhalation of amyl seems perfectly free from danger to life, and may be intrusted to the care of any intelligent nurse. In this asylum the nurse always has ready a cone of blotting-paper, into which are dropped from four to six minims of the amyl. The cone is then applied to the face, and one of the medical officers sent for, who remains with the patient till the end of the fit."

Dr. Talfourd Jones records his experience of the effects of nitrite of amyl in the *Practitioner* of October, 1871. Some of the cases are remarkable: "At twelve o'clock at night, a woman begged I would instantly go and see her daughter, who, she said, 'was in a dying state.' On entering the bedroom I saw the patient, a young married woman, half undressed, sitting on the corner of the bed, and holding on to the bedpost. There was a dusky leaden hue about her face, neck, chest, and hands, and a cold, damp sweat clung to her. Her body generally was cold, but her feet and legs were of an icy coldness. Her pulse could scarcely be felt. She was making violent efforts to breathe, and each inspiration was accompanied by marked recession of the supra-clavicular and intercostal spaces. Loud sibilant *râles*, with sonorous rhonchus, could be heard over the greater part of the chest. She tried to speak, but could only make faint gasps. The thought instantly occurred to me that the nitrite of amyl, which I had procured only a short while before, might be of use. I ran back to my house, which was close by, and returned with the bottle. Five drops were applied on a piece of lint to the nostrils. In half a minute her face began to redden, and in less than a minute was deeply flushed; her heart palpitated, her carotids throbbed, warmth of body quickly returned, and her breathing became easy. The effect was marvellous, and I felt nearly as much astonished as her father and mother.

"Five months afterward I was again summoned. This time it was nothing more than an ordinary severe bout of asthma, wanting the signs of severe collapse. A repetition of the amyl-treatment was followed by results as speedy and effectual as in the first instance.

"Mr. G., aged forty-four, had been subject to occasional attacks of asthma for some years. On the 6th of last March he had a rather bad attack, and when I saw him there was some bronchitis as well.

"Inhalation of the nitrite instantly relieved his asthmatic breathing. In six or seven minutes after, it returned, though in a lessened degree. Again he inhaled the amyl, and again with relief, but for the next hour there was every now and then a tendency to the occurrence of the bronchial spasm, which was relieved at every inhalation. He went to bed and had a good night. Next day the asthma was gone, and a little bronchial catarrh only remained.

"In the next case, one of cardiac dyspnoea, Dr. Jones relates how

he was cupping the patient in the lumbar region. The blood flowed slowly, and it occurred to him to see the effect of amyl. 'I immediately applied about ten drops on lint to the nostrils. Soon the radial pulse throbbed, then the face became flushed, and at the same instant blood flowed freely into the cupping-glasses."

The other cases related are of patients suffering from angina pectoris, syncope caused by puncturing an abscess, epilepsy, laryngeal spasm, colic and enteralgia, headache and facial neuralgia. The last case leads Dr. Jones to think that nitrite of amyl will prove a valuable remedy in that form of tic called by Trousseau "epileptiform neuralgia."

Dr. Jones concludes by saying that he leaves for future publication some remarks on nitrite of amyl as an antidote to certain poisons, merely mentioning that there are well-founded physiological reasons for believing that amyl is in many respects antagonistic to chloral and ergot; that it is likely to be a valuable agent in cases of overdosing by chloroform; and that it is capable, generally, under certain conditions, of counteracting the tendency to death by anæmia, syncope, and apnœa.

II.

PHYSIOLOGY AND PATHOLOGY OF THE BRAIN AND NERVOUS SYSTEM.

PREPARED BY DR. H. D. NICHOL, OF NEW YORK.

I.—*Report of the Meeting of the "Verein für Psychiatrie u. forensische Psychologie in Wien," held December 30, 1871. (Psychiatrisches Centralblatt, January 23, 1872.)*

DR. OBERSTEINER, Jr., read the following paper upon "The Theory of Sleep." The necessity of the brain for rest (i. e., for sleep) is produced by the accumulation of the products of the exchange of gases (probably of certain acids also), precisely as fatigue is occasioned in the muscles. The amount of such products of oxidation remaining behind and causing sleep depends upon the measure in which they are produced, and upon the rapidity with which they are eliminated by the blood from the brain. The second point varies according as the removal of blood in the brain is more or less rapid, and also according to the chemical constitution of the blood. The first is in exact proportion to the relative capacity of the brain. For the production of sleep, the greatest possible abstraction from all external impressions is necessary, and also from all mental conceptions which arrest and fix our thoughts; and only so long as this condition exists can sleep be present. Further, during sleep, the power of the will over thought and motion ceases (i. e., both thought and motion seem to be purely reflex in the strictest sense of the term), for that control to which they are subject when awake, and which gives to them the appearance of "free-

will," is no longer present. In the discussion which followed the reading of this paper, Profs. Leidesdorf and Beek, Drs. Rosenthal, Maresch, and Glatter, took part.

Prof. Leidesdorf presented the report forwarded by Dr. Grabacher, of the case of a boy suffering from cerebral disease and subsequent epilepsy, with remarks. The magistrate in B—— gave information, under date of July 23, 1870, that Franz Schweiger, son of Franz Schweiger, aged twelve years, was attacked with epilepsy while suffering from some cerebral disease, was dangerous to the community, and it seemed desirable that he should be confined in some public hospital.

In the report of the examination of the patient, made on August 15, 1870, by the authorized district physician, is the following: "Franz Schweiger, twelve years of age, of feeble physical development, has bristly hair, hears and sees well, is shy and suspicious, especially in the presence of strangers, keeps his eyes constantly fixed upon the ground, and can only with great difficulty be persuaded to look any one in the face even for a moment. He hesitates and stammers in replying to questions—pausing between each word. His mental capacity seems less than his years warrant. His complexion is pale, face utterly devoid of expression, cervical glands swollen, thorax small and flattened antero-posteriorly, clavicles prominent, abdomen enlarged, vertebral column straight, body moderately well nourished, skin dirty, temperature rather less than normal; edges of tongue marked by cicatrices, apparently caused by wounds of the teeth, indentations rather than actual bites; appetite enormous, without regard to the kind of food eaten; has one or more attacks of convulsions daily; and, according to the statement of his parents, passes urine in bed at night. When offered a small piece of money, with the promise that it should be his if he would repeat the Lord's prayer, after a little hesitation he began, but he articulated so indistinctly as hardly to be understood, and with such lack of expression as to make it evident that he had no idea of the meaning of the words he was uttering. Throughout the examination he manifested no vicious tendency—excepting, when for a moment he was left unwatched, he tried to escape from the room. In general terms, the patient has the appearance of a half-famished individual, mentally and morally weak, and at the same time refractory and malicious, afflicted with some severe internal malady, which, in its long duration, has shattered his intellect, severely affecting his brain and nervous system, so that he must be described as already imbecile or even idiotic, and very soon all hope of preserving or restoring his intellect must be given up, unless the force of his disease can be broken, and he be brought out of his present condition."

Scarcely was the examination completed, when the boy was seized with an epileptic attack, which lasted about ten minutes. He fell upon the floor, remaining, after the attack had passed off, stretched at full length—twitchings of the muscles of the extremities continuing for some time. He resembled a corpse; and, when lifted from the floor, he seemed like one stupefied and paralyzed—the expression of his countenance being still more vacant than before the convulsion.

The patient has five brothers and three half-sisters; he was nursed

by his mother for six months from his birth; has been vaccinated, and until two years of age was perfectly healthy. At that age he was badly frightened, and shortly thereafter began to suffer from convulsions, which steadily became more violent, and increased in frequency. He went to school, but at the end of a year was obliged to discontinue going, because the attacks had become so frequent and so violent that the other children were terrified by them, and the parents were fearful lest their own healthy children should be frightened into a similar condition. The patient had already learned to read, but was unable to write or cipher; he had learned to recite several prayers, and even now could repeat some of them. Earlier, his articulation had been good, and he had seemed to be possessed of considerable mental capacity. In time, his condition had grown worse; his gait became unsteady, speech became more stammering and unintelligible, the convulsions, which were considered by his family to be epileptic, became more severe, and were repeated much more frequently. He developed an uncontrollable desire to appropriate to himself at home and abroad every thing he could carry away, especially bread, potatoes, fruit, money (by preference small change), and matches, all of which he would conceal, hiding them about the house, or burying them in the ground. He always proposes to buy sweetmeats with the money he steals. His father asserts that the boy not only eats a great deal without having any choice in regard to the quality of what he eats, but that often, when his hunger seems to have been satisfied, he will be found eating the refuse intended for the swine. He does no work, and it is impossible to induce him to work. He spends the days running about out-of-doors, or remains sitting or lying down in the house, until a paroxysm of his disease seizes him. He has been medically treated for a long time, with no beneficial result. No member of his family has at any time suffered from epilepsy or nervous or mental disease. Because of this ungovernable tendency to steal, and to run about everywhere, and because a few weeks previously he had attempted to set on fire a neighbor's house, he had latterly been confined in a dark room, and had been repeatedly violently beaten by his stepmother. The attacks to which the patient was subject were regarded in A— as epileptic. One of them would at times seize him in the street, when he would fall to the ground, utter a shriek, be seized with spasms and twitchings, which would last for a few minutes; then he would remain lying upon the ground for a length of time, stupefied and unconscious, until finally he would recover his normal condition.

The foregoing is the statement of his father, which the magistrate and villagers confirm.

Remarks.—From the result of the inspection of Franz Schweiger, aged twelve years, we may conclude that the patient has suffered from epileptic convulsions for years, and to such a degree that now he must be regarded as imbecile and idiotic. He has at the same time, however, an unequivocal tendency to steal, and to commit such acts as render him dangerous to the community.

He is to be considered as diseased, both in body and mind; in regard to his moral and intellectual development, he has been sadly in-

jured and neglected—he has been badly cared for by his immediate protectors. Whether medical and psychiatric means will, in his case, tend to restore health, or improve his condition, is very uncertain. Because of his extreme youth and freedom from all hereditary tendency to mental disease, the attempt ought certainly to be made.

The watching over the patient is important, on account of this tendency to be dangerous to the community. But still more important is it to endeavor to improve his neglected moral and intellectual condition, which has a direct bearing upon the psychiatry of the case.

These intentions, viz., the employment of medical and psychiatric means, and the watching over the boy, cannot be accomplished in the house of his parents. If left in his present helpless condition, he must become an unhappy offering to his disease and to starvation. The above-mentioned intention can alone be carried out in a public hospital for the insane, and even there only possibly.

The patient, Franz Schweiger, aged twelve years, epileptic, mentally deranged, dangerous to the community, is, for the foregoing reasons, not only in his own interest, but also in that of the community at large, a most fitting subject for confinement in a public hospital for the insane, to be placed in the department of epileptic and mental diseases.

The question, whether this disposition to steal, to commit arson, and the like, depends upon his diseased mental condition, should probably be answered in the affirmative; but it will afford a most interesting topic for discussion in relation to its psychological and psychiatric bearings.

2.—*Commotio Cerebri*. By H. FISCHER. *Sammlung Klinischer Vorträge, Herausgegeben*. Von R. VOLKMANN, 1871. (*Psychiatrisches Centralblatt*, January 23, 1872.)

In the absence of any sure anatomical knowledge in regard to the mechanical conditions of concussions, the older investigators believe that a molecular displacement of the particles of brain-matter resulted from the shock, and, owing to the minuteness of these particles, no method of examination was able to detect them. This view is held even to-day by the majority of authors. Fischer first attempts to show the incorrectness of this view, and the supposition seems likewise to him untrue that the symptoms of concussion of the brain depend upon a multitude of interstitial lesions, the rupturing of brain-fibres and blood-vessels (Rokitansky and Nélaton).

The most prominent symptom of concussion, as Fischer declares, is coma. Experimental and clinical investigations have alike proven that coma is produced by deficient oxydation of the nerve-tissue, especially of the ganglion-cells of the cerebrum. This imperfect aëration of the ganglion-cells may be caused by a sudden interruption in the cerebral circulation, or by an insufficient quantity of oxygen in the brain, as seen in disturbances of respiration; or, by the action of certain poisons, which prevent the oxygen from being given off to the tissue (Johnson).

In *commotio cerebri* the last-named cause is of course out of the

question, and we must turn, therefore, to the interruption in the cerebral circulation.

How can a concussion of the brain cause an emptying of blood from the arteries?

Bearing in mind the physiological experiments of Nothnagel (who discovered that, when he applied strong reflex irritation to the nerves supplying the blood-vessels, a contraction of the cerebral vessels took place), we might infer that, as a result of the mechanical irritation of a concussion, a reflex contraction of the cerebral arteries would be occasioned, causing anæmia of the brain and coma. But, as Fischer asserts in the commencement, there are important considerations in opposition to this view; in particular, the short duration of the contraction in the arteries does not correspond with the length of time (often for days together) the symptoms of concussion remain; and no experiment has ever succeeded in producing coma by means of mechanical or electrical irritation; i. e., in producing reflex contraction extending over a wide range of cerebral vessels.

Fischer finally arrives at the conclusion that the symptoms of concussion of the brain depend upon a *reflex paralysis of the cerebral vessels*.

As a foundation for this view, Fischer makes use of the beautiful experiments of Goltz, who caused reflex paralysis in the frog, by striking it upon the abdomen. Bearing this fact in mind, Fischer was able in one instance to explain the clinical phenomena of a concussion. The reflex paralysis of the cerebral vessels following upon the concussion produces first a pretty considerable anæmia and venous congestion. The heart's action is diminished, and becomes irregular, the contraction of the arteries is interrupted, and hence the flow of arterial blood to the brain is very small. Besides this, Goltz has shown that the paralyzed vessels are useless for circulation, and therefore for nutrition also. The brain receives very little blood, and is unable to make use of the little it does receive. The blood collects (precisely as in a concussion) in the relaxed and toneless veins. Hence we have stasis and congestion in the cerebral veins and sinuses, and coma results. The diminution in the heart's action and in respiration, which occurs in *commotio cerebri*, indicates, according to Fischer, that irritation still continues at the point of origin of the vagi, while the cerebrum is in a state of the profoundest paralysis, from which it may be inferred that the cerebrum requires more blood for the performance of its functions than the spinal cord requires.

The convulsions, which are rare in concussion, argue very little against Fischer's view; since (although Kussmaul and Tenner have produced convulsions by causing cerebral anæmia) it is well known that the point of origin of convulsions (*Krampf continues*) (which, according to Nothnagel, is located in the pons, and, according to E. Weber, in the medulla oblongata) is very difficult of irritation; and, therefore, a very great degree of irritation is required in order to produce convulsions of an epileptic character. Hence Fischer concludes that he is not in error in pronouncing *commotio cerebri* to be a *shock of the brain*.

In *commotio cerebri* we recognize two periods—that of depression, and that of exaltation. As soon as the reflex paralysis ceases (i. e., when the relaxation of the blood-vessels takes place in the first period), an increased flow of blood is sent to the brain.

The dangerous cases are those in which, in addition to the reflex paralysis of the cerebral vessels, a general paralysis of the blood-vessels occurs. If to the recognized symptoms of concussion be added disturbance of vision, paralysis of the muscles of the orb, aphasia, etc., the case is one of some cerebral lesion, most probably of an apoplectic nature. Fischer points out that, very often after violent concussion, stupor, loss of memory, and tendency to vertigo, remain behind for a long time, and occasionally very severe mental diseases follow.

In treatment, we must avoid all exhausting remedies, and never use ice-applications. In some cases, external and internal stimulants, even musk, are indicated.

4.—*A Contribution to our Knowledge of the Nerve-centres which preside over the Blood-vessels.* By DR. SEBOROFF. *Mediz. Jahrb.* 1871, iv. (*Psych. Centralblatt*, January 23, 1872.)

Slight irritation of the medulla oblongata in the frog causes contraction of the blood-vessels in the web of the foot, and a retardation of the circulation, even after division of both *nervus vagi*. These phenomena are never observed in the mesentery. Hence, the stasis in the vessels of the web cannot be occasioned by cessation of the heart's action; and we can also assume that the nerve-centres for the mesenteric blood-vessels is not the same as the one for the vessels of the web. After section of the *nervus ischiadicus*, the above results were not observed upon the injured side. Therefore, we must look for the nerves which supply the web in the *ischidium*.

5.—*The Theory of Moral Idiocy, and its Importance in Jurisprudence.* By DR. K. von KRAFT-EBNIG. *Friedreich's Blätter für Gerichtliche Medizin.* Heft v., 1871. (*Psychiat. Centralblatt*, January 23, 1872.)

The writer discusses those diseased conditions which have reference exclusively to the moral part of our being, and through which the *character* seems especially to be affected; although the general intellectual processes remain intact, and hallucinations and illusions are absent. He points out their importance, as well in criminal psychology as in ordinary penal justice.

Until the present time, we have been contented with establishing the moral depravity of an individual, in order to regard him as a criminal and to punish him accordingly; without reflecting that this moral degeneracy and habit of crime may have originated in a diseased cerebral organization, either inherited or congenital. To this agree the trials during the past year of such great criminals as Chopinsky, Jeaneret, and Lemaire, as well as the abundant experience of prison physicians.

A purely psychological examination is sufficient to establish the degeneration and moral ruin brought about by psychical causes, as bad education, vicious manner of life, etc. The moral confusion produced by a diseased condition of the brain requires other tests, to which the important symptoms (in a psychical point of view) may be referred.

Grohmann was the first in Germany to recognize a moral degeneracy in man originating in organic causes. Already, in 1819, he had spoken of congenital moral insanity, and of congenital moral idiocy. In 1842, Prichard in England advanced the theory of "moral insanity," which was upheld in France by Morel and others. Two categories of morbid moral conditions were given: First, the inherited, morbid moral condition (moral idiocy), characterized by symptoms of degeneracy, transmitted by means of the creative germ—among which epilepsy and drunkenness in the ancestor play the principal part; and, second, the condition of inherited moral derangement.

In the first case the degeneracy appears either in the earliest stages of moral development, as utter incapacity for acquiring moral judgment and moral perception (and this too in spite of the best surroundings); or, it first manifests itself at the (especially for hereditary cases) dangerous period of puberty, following upon a brief attack of mania, acute delirium, etc. The second moral derangement develops after severe cerebral disease, following immediately the attack which has seized upon the brain; and it can itself assume the appearance of a psychical disease; or it may appear in connection with the symptoms of a real psychosis, or as an intermediate stage of a psychosis.

The writer examines carefully into the manifold functional disturbances in the nervous system, as well as into the psychical deformities of the victims of moral derangement. The anomalous condition of the brain evinces itself in the greater tendency to the development of prominent mental disturbances which may be transmitted to the next generation; for example, predisposition to cerebral congestion; feeble toleration of alcohol; great disturbance of speech; considerable diminution in the scope of the intellectual capacity, even to the extent of imbecility; in anomalies of the natural instincts—especially of the sexual instinct.

Among the physical deformities are, anomalies in the formation of the skull, too early union of the sutures, and dissimilar development in the corresponding portions of the brain resulting from this—fœtal endymenitis and meningitis, with secondary hydrocephalus, deformities of the extremities; hare-lip, cleft palate, strabismus, arrest of development in the organs of generation, etc.

The anomalies in the psychical manifestations appear as a more or less complete moral insensibility; absence of moral judgment; conception, creating great egoism and increased self-importance; in perverse impulses toward the commission of, sometimes odd, sometimes criminal acts, especially sexual excesses, vagabondage, theft, and abuse of alcohol. The writer concludes with the citation of several examples of moral insanity, which had been brought under the control of law as criminals.

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[The Original Department of this journal is not closed to articles, the views of which may be in opposition to those held by the editor. He does not, however, wish to be considered as indorsing any opinions unless enunciated under his own name.]

ART. I.—*Clinical Lectures delivered at the Bellevue Hospital Medical College.* By WILLIAM A. HAMMOND, M. D., Professor of Diseases of the Mind and Nervous System, and of Clinical Medicine, in the Bellevue Hospital Medical College; Physician-in-Chief to the New York State Hospital for Diseases of the Nervous System, etc. Reported and the Histories prepared by T. M. B. CROSS, M. D., Assistant to the Chair of Diseases of the Mind and Nervous System, and one of the Attending Physicians of the New York State Hospital for Diseases of the Nervous System.

LECTURE VIII.

CEREBRAL HÆMORRHAGE.

THERE is no affection, in the whole range of diseases of the nervous system, which it is more important that you should be thoroughly acquainted with, than that which I propose to consider to-day, and which, so far as its symptoms are concerned,

has been confounded until very recently with a number of different cerebral affections. By cerebral hæmorrhage is understood that condition which is due to the rupture of a blood-vessel, and the consequent extravasation of blood either into the substance of the brain, or into its ventricles, whereas the term apoplexy is generally applied to sudden causes, however induced, and consequently embraces a large number of diseases in which the prominent symptom is loss of consciousness. Formerly medical writers were in the habit of grouping together, under the term apoplexy, several different affections, but a better knowledge of the subject has taught us to separate and distinguish these from each other, so that embolism, thrombosis, meningeal hæmorrhage, and many other diseases, are readily diagnosticated from cerebral hæmorrhage. There are two forms of this affection, which are called the apoplectic and the paralytic, and which differ from each other in this respect, that, in the former, the mind is suspended in its action, whereas, in the latter, there is no loss of consciousness, although the mind does not generally act with its accustomed vigor after the attack.

Having thus briefly called your attention to the topic upon which I shall lecture to-day, in these few preliminary remarks, I will now proceed to read the history of the following case:

CASE I. *Cerebral Hæmorrhage*.—"Eliza G., forty years of age, single, was born in New York City, and is a washer-woman by occupation. About five years ago she had a very severe attack of typhus fever, after which she found that her eye-sight was more or less impaired, and that her hearing, memory, and intellect, were also somewhat affected. Prior to this, however, she had been a very healthy woman, and had always been remarkably temperate in her habits. She has never had syphilis, gout, nor acute articular rheumatism, but for some time past she has complained of shortness of breath, and great precordial distress on taking violent exercise, such as running up-stairs quickly or otherwise unduly exerting herself. For the last three months she has suffered from violent attacks of asthma, which have troubled her very much. Her mother, when about sixty years of age, was paralyzed on one

side of her body, and her speech was much affected. Although she lived for several years after this attack, she never completely recovered from her hemiplegia, nor did she ever regain the normal use of the faculty of speech. A brother, at the age of sixteen, was suddenly seized with loss of consciousness, and died in the course of two hours afterward. During this attack he had no convulsive movements whatever, and he never rallied from his apoplectic condition. He had, however, organic disease of the heart.

"The first symptom which attracted the attention of this patient occurred about the 3d of October, 1870, at which time she was suddenly seized with a violent pain across the forehead, which returned at intervals for a period of at least two weeks before she was paralyzed. October 17th, as she was engaged in washing, leaning over the edge of a tub in a constrained position, she suddenly felt very dizzy, and her sight grew misty and dim; she left her tub and reeled across the room, but was almost immediately supported and placed in a chair. For a short space of time, her ideas were much confused, but during the attack her consciousness was unimpaired.

"On endeavoring to speak she found that her speech was very much impaired, and it was with very great difficulty that she could make her wishes known to her friends. Mobility on the right side was lessened, while tactile sensibility was also diminished. The muscles of the face were drawn to the left side, while the tongue pointed toward the right. There was internal strabismus of the right eye. The patient came to the Out-door Department of the New York State Hospital for Diseases of the Nervous System, October 24th, just one week after the attack, and walked up the steps with very little assistance. At this time she complained of pain in the back of the head, and constipation of the bowels. She was directed to go home immediately, keep perfectly quiet, and guard against all undue efforts, such as leaning over to tie her shoes, straining in the water-closet, etc. Aloetic pills were prescribed to regulate her bowels, and she did not return to the hospital for treatment until November 10th, when I learned that the pills had had the happy effect of caus-

ing the pain in the head to disappear as soon as they had operated. Her condition was now as follows: owing to the paralysis of the tongue, the lips and cheek on the right side, her articulation is rather indistinct, yet by attention you can understand what she says very well. Her face is drawn to the left side, and the angle of the mouth drops on the right, from which the saliva every now and then dribbles. Her tongue deviates very slightly toward the right side. The pupils are both equal, and there is at present no strabismus. Her eyesight, hearing, memory, and intellect, have been more or less impaired ever since she had typhus fever, but she thinks that they are no worse at present than they were before this attack. Motility is much more impaired in the face than in the arm, and it is also more impaired in the arm than in the leg. She staggers occasionally after any considerable amount of exertion. The right cheek is flaccid and puffs out at times, while the food lodges in the cavity thus formed, to the great inconvenience of the patient. The muscles of the tongue are impeded in their normal movements, and consequently she experiences some difficulty in protruding that organ. The motility of the right arm is now very slightly diminished, and she is able to execute complex movements with it very well indeed. The right leg she raises well from the ground, the toe does not catch; and if it were not for a slight circumduction of the foot in walking, her gait would attract little attention. The tactile sensibility is equal on both sides of the body, while the muscular contractility, and the sensibility to electricity, are slightly diminished on the right side. Slight differences in temperature and the sensation of pain exist between the two sides. There is a suspicious-looking ulcer on the right leg, which has not yet healed. She displays no undue emotional excitability. Her heart was examined, and found to be healthy; the physical exploration of the lungs was made, but unfortunately the result was not recorded. Ophthalmoscopic examination of the eyes at this time revealed nothing abnormal.

"All the diseased muscles respond well to the Faradic or induced current; those of the face, however, requiring a stronger stimulus than those of the arm, and those of the arm a stronger stimulus than those of the leg."

Such, gentlemen, is the history of this very interesting case, which affords us a good example of the paralytic form of the disease now under consideration.

The first symptom which this patient noticed was a violent pain in the forehead, which was present at intervals for two weeks prior to the attack, and which pointed to cerebral difficulty. You know that in cerebral hæmorrhage there are a number of premonitory symptoms which are generally present for a variable period prior to the full development of an attack, and that these phenomena show a disturbance in the cerebral circulation. In some cases we have severe headache, as is well illustrated in the patient before us; in others we find difficulties in speech, which are due either to slight paralysis of the tongue, to paralysis of the cheek and lips, or other muscles concerned in articulation, or else are dependent upon a want of coördination in the muscles of speech, or there may be defects of sight, or numbness limited to one side of the body, which is not an uncommon occurrence, as several cases of this kind have fallen under my observation. Or there may be simply vertigo, with confusion of ideas, and specks before the eyes, which may precede the attack by only a few seconds, and be the only admonition which the patient has. Even in those instances in which there are premonitory symptoms, the attack takes place suddenly, as it did in the present instance. But, generally, there are present only those symptoms which occur directly before the attack, and which show both mental and physical disturbance.

When an individual is attacked with the paralytic form of cerebral hæmorrhage, he is perfectly aware of his condition, and soon discovers that his arm and face are affected, and that his speech is unintelligible. If, however, he be sitting or lying down, instead of standing, he does not discover that he is paralyzed until he attempts to rise. In a case of a distinguished officer of the army, after a fatiguing day of ceremony, who was returning in his carriage to his hotel, as he passed along Fifth Avenue, he suddenly experienced an indescribable sensation, and then became aware of the fact that he could only see the half of objects. He did not lose consciousness, although when he arrived at

the hotel, and attempted to get out of his carriage, he found that he was paralyzed on the right side, and that his speech was so much impaired that he could not make himself understood. In the case of this woman, who is now before us, the attack came on suddenly, and in a very short time involved the whole of the right side of the body. Her speech was so much affected that it was with great difficulty that she could make herself understood. Her face was drawn to the left side, which shows that the muscles of the right side are paralyzed, and that their antagonists still act in a perfectly normal manner. When the face is involved, scarcely any distortion is perceived when the patient does not attempt any facial movements; but if he endeavors to open his mouth, to spit, or to puff out the cheeks, the paralysis is at once evident. In the majority of cases of cerebral hæmorrhage, we find that the facial paralysis soon disappears, together with the difficulties of speech, while the arm and leg still remain paralyzed. The mind becomes more active, and the affected limbs more capable of motion. Usually the leg recovers power much more rapidly than the arm, so that the patient can generally walk very well long before he can raise his arm from his side, bend his elbow, or extend his fingers. The paralysis in the leg is particularly marked in those muscles which extend the foot, and this gives rise to a peculiar gait, in order that the patient may clear the toes from the ground. This is accomplished by means of the abductor muscles, which are rarely affected. When the patient walks he throws the leg out from the body by means of the muscles of the thigh, so as to prevent dragging his toes on the ground.

Besides these disorders of motility, sensibility is more or less affected. The limbs on the affected side feel heavy as if made of lead, and after a while disordered sensibility is experienced by a feeling as if pins and needles were sticking into it, or as if the limbs were asleep, or as if ants were crawling over the skin, or water trickling over it. In Eliza G.'s case you will observe that the improvement took place first in the leg, then in the arm, then in the tongue, and lastly in the face. We generally find, however, that the difficulty in speech and the loss of power in the muscles of the face disappear before the paralysis of the

extremities. You will observe too, that there was external strabismus on the right side, which shows that the third nerve was partly paralyzed, so that the abducens still acting rotated the eye outward. The hæmorrhage, which in this case was on the left side of the brain, must have been small in amount, as the paralysis speedily disappeared, and left behind only the implications of the face and the muscles of the tongue.

You also notice, from the history of the case, that the patient came to the hospital one week after the attack, and that she was advised to go home and to keep perfectly quiet, until all signs of irritation of the brain had disappeared, when it would be proper to commence treatment. I prescribed aloetic pills in order to move her bowels, which were constipated, and advised the patient to delay active measures to restore the power of motion until two or three weeks had elapsed. A clot in the brain is to all intents and purposes a foreign body; as this cannot be removed excepting by certain fixed and definite changes, it is necessary to sustain all the powers of the system in order to promote the absorption as rapidly as possible, and this is accomplished by keeping the patient perfectly quiet, with the head well elevated, the room cool and thoroughly ventilated, and other indications should be met as they arise. After the lapse of two or three weeks we should commence to take active measures to restore the power of motion, and to prevent those contractions which tend to make restoration much more difficult. This we will try to do by hypodermic injections of strychnia, in doses of a thirty-second of a grain every alternate day, and by the use of the induced current, as this is found to cause contractions of the muscles on the diseased side until they are fully restored.

[NOTE.—The treatment in this case has consisted solely in the application of the Faradic current to all the muscles which were involved in the disease on every alternate day, and in the course of six weeks improvement had taken place to such a degree that the patient ceased coming to the hospital. At the time of her discharge there was a slight paresis of the muscles of the right leg, which depended upon a weakened condition of the extensor muscles, which had not yet regained

their tone. The right arm had almost entirely regained its normal vigor. There was still some slight difficulty of speech, but this depended more upon the paralysis of the facial muscles than upon the impairment of the muscles of the tongue, for the former was even now well marked, while the latter had nearly disappeared.]

CASE II. *Cerebral Hæmorrhage with Left Hemiplegia.*—

“Joseph E. Pope, sixteen years of age, was born in New York, and is a soap-manufacturer by occupation. When eight years old he had an attack of acute articular rheumatism, which lasted about six weeks. Every autumn since then he has been troubled more or less with severe seizures of subacute rheumatism, which would persist for a variable period, and then readily disappear under the use of the iodide of potassium. Subsequently he had shortness of breath and violent palpitation of the heart whenever he took any violent exercise whatever, and this has been a very great discomfort and source of annoyance to him. He has no hereditary predisposition to diseases of the nervous system. In November, 1869, while stooping over to tie his shoe, he was suddenly seized with an intense pain in the right frontal region, accompanied with vertigo, dimness of vision, and general confusion of ideas. Loss of consciousness rapidly supervened, the patient falling forward, but before striking the floor he was caught by his brother. He remained completely unconscious for at least an hour, and, after he had revived and regained to some extent his senses, his left side was found to be completely bereft of motility and sensibility. The face was drawn to the right side and the tongue deviated. He was unable voluntarily to close his left eye. His speech was thick and indistinct, owing to paralysis of the muscles of the tongue. He was confined to his bed for the period of a month, after which he became able to move about a very little with assistance. Improvement in speech took place first, and the leg followed next in order. At the end of six weeks he was able to go about without any support whatever. After the lapse of three months the muscles of the face and tongue had entirely regained their normal contractility, but the leg and arm

were still very much impaired. He was treated about this time daily by means of a weak induced current, but with very little benefit, so far as he was able to judge. He was admitted to the Out-door Department of the New York State Hospital for Diseases of the Nervous System, September 26, 1870, at which time he was in the following condition :

“ Motility is greatly impaired on the left side of the body, yet the muscular power is much more deficient in the arm than in the leg. The left upper extremity hangs by his side quite powerless, and the only motion which he can give to it is a slight lifting of the humerus by means of the muscles of the shoulder. The thumb is drawn into the palm of the hand, and the fingers are rigidly flexed upon it. In fact, motility in the left upper extremity is almost *nil*. The hand cannot grasp the dynamometer, owing to its extreme rigidity. His left foot is adducted to a very great degree, and in walking he swings it in the arc of a circle, and even then he stubs his toe at nearly every step, from the weakness of the extensor muscles. There is much atrophy of the muscles of both the arm and the leg, but more particularly the former. The tactile sensibility, and sensibility to pain, are normal on the diseased side, while the sensations of heat and cold, and muscular contractility, are more or less diminished. The temperature is also diminished on the diseased side. The bladder and rectum are normal ; the urine is healthy and acid in reaction. His memory and intellect are somewhat enfeebled. There is no difficulty whatever at present in closing the right eye voluntarily. He has had only this one attack, and neither before nor subsequently to it has he had any head-symptoms whatever. Physical exploration of the heart shows that this organ is hypertrophied, and that there are both mitral and aortic organic valvular lesions. The lungs are healthy. The pupils are equal and respond readily to light. Ophthalmoscopic examination shows that the optic disks are in a healthy condition, and that the retinal circulation is normal.”

This case is particularly interesting from the fact that it is very difficult to decide definitely whether it be one of embolism or cerebral hæmorrhage, although I am inclined to the

belief that it is a case of cerebral hæmorrhage; nevertheless, without a *post-mortem* examination, no definite opinion can be given. The attack came on in a young man only seventeen years of age, who had had acute articular rheumatism, which was subsequently followed by disease of the heart, which gave rise to organic lesions both mitral and aortic. The attack was, however, apparently induced by strong muscular exertion while stooping over to tie his shoe. In a case of partial or complete hemiplegia, with or without loss of consciousness which occurs in a patient under forty years of age, with the hemiplegia on the right side, no muscular contractions and organic disease of the left side of the heart, with or without previous attacks of acute articular rheumatism, we may safely predict that the cause of these phenomena is cerebral embolism. The cause of the paroxysms, which we can justly attribute to the constrained position of the patient, the lesion being on the right side of the brain, while the resultant paralysis was on the left side of the body, the marked muscular contractions which have lasted already several months, and the subsequent improvement in the arm and leg, all favor the view that the patient is suffering from an extravasation of blood into the right hemisphere much more than they point to embolism. In embolism contractions never take place, and if the paralysis does not disappear within three days after the attack, it does not gradually fade away as it so often does in cerebral hæmorrhage. Then, again, there was a short premonition in this case, as was shown by the pain in the head, the vertigo and confusion of ideas, symptoms which indicate hæmorrhage rather than embolism, for in this latter affection there are no premonitory symptoms.

You are aware that advanced age is the most influential circumstance which predisposes to an attack of cerebral hæmorrhage, and this fact has been recognized ever since the days of Hippocrates. It is much more apt to occur in persons over forty years of age than in persons under this age, although the number of the latter is, comparatively speaking, very small. Of two hundred and twenty-nine cases of cerebral hæmorrhage which have fallen under my professional charge within the last five years, two hundred and four occurred in

persons over forty years of age, while the remaining twenty-five cases were in persons under that age. Of these, seventeen were attacked between thirty and forty, seven between twenty and thirty, and one, the patient before you, is only seventeen years of age. This is the youngest patient that has fallen under my observation, who was afflicted with cerebral hæmorrhage. There is another point in this case to which I wish to call your particular attention, and that is the difficulty which the patient experiences in closing his left eye voluntarily. You remember that Dr. Cross particularly mentions that fact in the history of Pope. In facial paralysis of cerebral origin the muscles of the face are incapable of expression, and are usually paralyzed on the side opposite the lesion, excepting in some rare instances in which the paralysis of the face is on the opposite side to that of the body, and the orbicularis-palpebrarum muscle remains unaffected, the patient being able to close the eye; whereas, in simple facial paralysis, this muscle is always involved, and consequently the eye remains wide open. It is from this circumstance that we are able to diagnose a cerebral from a peripheral paralysis. Although this patient is quite certain that he could not close the left eye for some time after the attack, yet at present you see that he can do so with the utmost ease. He has not had any irritation of the left eye, as he undoubtedly would have had if there had been much loss of power in the orbicularis muscle, and it had remained thus involved for any considerable length of time. You who have seen many cases of facial paralysis will remember that the patient is unable to close the eye on the affected side, and, in consequence of this condition, the eye is continually exposed to the action of the atmosphere and the many particles of matter which are constantly floating about in it. The patient is also unable to wink, and, as a result, the tears, instead of being distributed over the surface of the eyeball, or carried away by the nasal duct, run over the lower lid upon the cheek, which they keep in a continual state of irritation, while the eye is constantly exposed to the particles of dust which accumulate upon its dry surface, and there remain on account of the loss of power in the constrictor muscle of the eye, whose function is thus impaired. The present case does

not, however, invalidate the general law that, in facial paralysis of cerebral origin, the orbicularis-palpebrarum muscle is not involved, and the patient can close the eye on the affected side. All writers upon diseases of the nervous system have noted this fact, and have called attention to it as the diagnostic point between facial paralysis of cerebral and peripheral origin; nevertheless, in some rare cases this muscle is partially involved, but never to the same degree as in simple facial paralysis; and it is doubtless owing to this circumstance that the eye does not become inflamed, inasmuch as the muscle is not sufficiently affected to deprive it from partially performing its proper function.

You also observe the marked contractions which exist in the muscles of Pope's left arm. I will now call your attention to the position of the upper extremity in well-marked cases of cerebral hæmorrhage in which there is almost invariably a disposition toward contraction of the pectoralis major and minor muscles, so that the arm is drawn across the front of the chest. At the same time the latissimus dorsi, the trapezius, the rhomboidei, the teres major and minor muscles, are generally in a state of relaxation, and eventually tend to atrophy. The elbow is slightly flexed, the wrist bent upon the forearm, and the fingers drawn in toward the palm of the hand. In some instances the thumb is drawn in to the palm of the hand, and the fingers are so rigidly flexed upon it that it is impossible to extend them, and the palm of the hand is lacerated by the sharp nails impinging against its surface. It is a curious fact, however, that the muscles of respiration are never affected in cerebral hæmorrhage unless the medulla oblongata be involved. You remember that this patient was completely unconscious for an hour, and then gradually regained his senses; so that you have here an example of the apoplectic form of cerebral hæmorrhage in which the patient falls, is comatose, breathes stertorously, the lips and cheeks puff out with each expiration, the pulse is slow and full, the pupils are dilated, sensibility and the power of motion are abolished on one side of the body. The bladder and rectum are generally not affected. In a short time consciousness commences to return, and you can arouse him from his condi-

tion of insensibility. He now attempts to move, though with difficulty, and tries to speak. Articulation is, however, indistinct, for the muscles on one side of the face are paralyzed and the tongue, for a like reason, is restricted in its movements. If the patient be now examined, paralysis will be found to exist in the limbs of the same side, and involve the loss of sensibility, as well as of motion, although rarely to the same degree, as the former is less affected than the latter. In the case of Eliza G., the paralysis of the arm and leg rapidly disappeared, and at the time of her discharge there remained only paralysis of the face on the affected side, and some difficulty of speech.

In the patient before us, although nearly a year has elapsed since the onset of the attack, yet we find no embarrassment of speech, no facial paralysis, no difficulty in closing the right eye; but there still remains great loss of power in the left upper extremity, the fingers of which are so firmly flexed into the palm of the hand that the patient is unable to grasp the dynamometer so as to measure the amount of loss of power upon that side, and the only motion which he can give to his arm is through the muscles of the shoulder, by means of which he is able to move this member to a slight degree from the side of his body, which fact shows that even the muscles of the shoulder are visibly affected. The lower extremity is not only much impaired, but its nutrition has also suffered as is shown by the atrophy in that part. The temperature on the affected side is also diminished, as is generally the case in these affections, and, although tactile sensibility is now normal, yet the sensations of heat and cold are still impaired.

The mental characteristics of a patient will also be found to have undergone a radical change. He is irritable, unreasonable, and fretful. His sense of the proprieties of life, which in health may have been very delicate, becomes obtuse. His memory is notably impaired, and his reasoning powers greatly diminished. But the greatest change that will be perceived will be found in the emotional faculties. He will laugh when he should cry, and he will shed tears at the veriest trifle—and this characteristic will remain for years. In Pope, the memory and intellect are both found to be impaired, although not

to a very marked degree, and his emotions have also undergone a radical change, as you will observe a circumstance in no degree ludicrous whatever will readily excite his mirth. Even in this case in which there are such well-marked contractions, and so great a loss of power upon the affected side, we can hope for marked improvement by a proper course of treatment, although in all cases of cerebral hæmorrhage a patient is neither mentally nor physically the same after an attack as before it, yet in some cases he may regain to a great extent his mental and physical health. I shall advise in the treatment of this patient the use of hypodermic injections of strychnia in the same manner as I have mentioned in the former case, and the employment of the primary galvanic current until the contractility of the muscles is so far restored that we may judiciously make use of the induced current.

[NOTE.—*February 16, 1871.* The patient at this time was in the following condition: There had been a progressive and gradual improvement in both the upper and lower extremities—the leg, according to the general rule, commencing to improve first, and in this respect it has excelled the arm in its progress. The foot was only a little adducted, and there was less inclination on the part of the patient to swing it as much as formerly. The muscles responded well to a weak Faradic current, and were very much better nourished than they were when he first came under observation. He could use his leg very well, as evinced by his ability to walk long distances with greater ease; his toes still caught occasionally; the fingers, although weak, were supple, and he was able to give to them a certain degree of motion. He could grasp an object when put into his hand, and could flex his forearm upon his arm, touch his nose or the top of his head with his left hand with facility. At this period he passed from under my observation.]

The treatment has consisted in the application of the primary galvanic current to the diseased muscles until they were susceptible to the induced current, when the latter was substituted for the former. These applications were made three

times a week, and at the same time a hypodermic injection of the sulphate of strychnia, varying in amount from the forty-eighth to the thirty-second of a grain, was also given on every alternate day, *pro re nata*. This course of treatment was steadily pursued for over a year with beneficial results. During the month of October the diseased side, which had been anæsthetic, became much more sensitive to electricity than the sound side, and this hyperæsthesia, after lasting about two months, disappeared.

T. M. B. C.

LECTURE IX.

CEREBRAL HÆMORRHAGE.—HÆMATOMA OF THE DURA MATER.—
CEREBRAL THROMBOSIS WITH CROSS-PARALYSIS.

IN the previous clinical lectures I have presented you with three good examples of cerebral hæmorrhage, in one of which there was cross-paralysis with left hemiplegia; in another the whole of the right side of the body was involved, while in the last case the paralysis was limited to the left side of the body. In all of these patients the face has also been affected, and in the last two we have found more or less embarrassment of speech, with impairment of the muscles of the tongue. I will to-day, gentlemen, continue this interesting subject, and speak to you more fully upon certain points which I was obliged to omit in the last lecture; but before doing this I desire to call your attention to another instructive example of this disease, the history of which has been prepared by Dr. Cross. This patient is the wife of the man who was present at a former clinic when I spoke to you upon the subject of cross-paralysis; and, while she is paralyzed upon the right side, her husband is paralyzed upon the left.

CASE III. *Cerebral Hæmorrhage with Right Hemiplegia.*
—“Elizabeth Ann Fetter, thirty-eight years of age, was born in New York City; is married, and the mother of fourteen children, of whom five are at present living. Her mother and father both died of consumption. Her husband is hemiplegic

on the left side of his body. She has never had syphilis, acute articular rheumatism, nor is she predisposed to diseases of the nervous system through any hereditary tendency. She has always been a remarkably strong, robust woman, enjoying the best of health, with the exception of attacks of dimness of vision, mist before the eyes, and other perversions of sight, together with transient spells of vertigo, which, during the early part of the year 1863, occurred at more frequent intervals than usual, although for a year or two previous to this time she had been subject to them. She has no disease of the kidneys whatever. In March, 1863, she had bilious remittent fever, and while convalescing from this she suddenly lost the power of speech. There was no loss of the memory of words, no defect in the faculty of coördination, but simply a paralysis of certain muscles used in the act of speaking. There was no paralysis of the limbs, nor of any other part of the body, excepting the muscles of the tongue. For two hours she was totally unable to utter a single intelligible word, but with great effort she could give vent to strange and hideous sounds. After having been freely bled she suddenly regained the normal faculty of speech. This attack took place just two weeks prior to her confinement, which was natural in every respect. For two years subsequent to this she enjoyed her own good health, having occasionally, however, slight cerebral congestive attacks, which were characterized by pain in the head, vertigo, ringing in the ears, disturbances of vision, etc., but not attended by loss of consciousness. In March, 1865, while stooping over in a constrained position washing the floor, she suddenly became dizzy, felt very much confused in regard to her ideas, could not see, and cried out, 'I am paralyzed.' Her husband, who was near at hand, caught hold of and supported her, otherwise she would have fallen. She was placed in bed, and shortly after examined, when it was discovered that the right arm and leg, together with the tongue, were very much paralyzed, and that tactile sensibility was unaffected. There was no paralysis of the muscles of the face, no strabismus, no ptosis, no difference in the size of the pupils, which were normal. After this seizure the patient was confined to her bed, and in the course of a week was delivered of a fine girl. At

the end of the third week she could just speak intelligibly enough to make her wants known, and in a short time she was able to move about by means of a chair, by which she supported herself. The leg began to improve very slowly indeed, and after the lapse of two years the arm still remained perfectly useless; her speech was quite indistinct, and her lower extremity was so much impaired that she was able to go about with difficulty. Six weeks prior to her confinement, which occurred in the month of June, 1867, after a violent attack of vomiting, she was again paralyzed. This was evident from a sudden increased difficulty in talking and a greater degree of paralysis in the leg. Although this attack was much less severe than the former, and the head-symptoms were very slight, it was, nevertheless, well marked. In the course of three weeks the lower extremity began to improve, then her speech; and for a considerable time this gradual progress continued, until, arriving at a certain point, it stopped. Her arm has remained about the same, or at least it has not recovered sufficient power to be of the least possible use to her. She gave birth to three children after this last attack, two of whom are alive and well, while the third died, when six months old, of cholera infantum. None of them had convulsions. The patient was admitted to the Out-door Department of the New York State Hospital for Diseases of the Nervous System, October 5, 1870, when she presented the following points of interest:

"There is right hemiplegia involving the arm, leg, and tongue. The right upper extremity hangs powerless by the side of the patient, and seems perfectly devoid of motor power, yet the fingers are supple, and there is no tendency to rigidity or flexion. She is able to walk, if her hobbling gait can correctly be called walking. There is the extreme swinging of the foot in a circle, and the constant dragging of the toes. Owing to a greater degree of paresis of the peronei and extensor muscles than that of their antagonists, the foot is adducted, and there is produced a variety of talipes very similar to that which is known as equino-varus. There is no paralysis of the muscles of the face, no deviation of the tongue, no ptosis, no strabismus, and no paralysis of the muscles of the lips. The

tongue is not very mobile, and, although she can move it in any direction, it is not accomplished with that ready facility which it ought to possess in its normal condition. She does not speak very plainly, and there is a tendency to clip her words, which is quite noticeable. There is no stammering or hesitation in her speech such as is found in the ataxic form of aphasia. There is merely a thickness or indistinctness of articulation which arises from a loss of motor power in the tongue. There is no loss of the memory of words, nor are there any constant disturbances of the intellect. The special senses are unaffected. The cerebral congestive attacks still recur, but are not so frequent as formerly. There is no atrophy of the muscles perceptible on the diseased side, and, as regards their size and fulness, there is no difference between the two sides; although muscular contractility is greatly impaired, it seems as though there is a corresponding lack of nervous energy in the diseased parts. The tactile sensibility is natural on the affected side, as are also the sensations of pain, heat, cold, etc. The bladder, rectum, and urine, are in a normal condition. The heart and lungs are healthy. There appears to be no marked loss of control over the emotions. The intra-ocular appearances were not noted, the eyes not being examined by the ophthalmoscope."

In this case we have presented to us many interesting phenomena which differ from those which we have found heretofore. You will observe, in the first place, that the face was not affected in the two attacks from which this patient suffered, although the arm, the leg, and the tongue, on the right side, were involved, nor was there any impairment of tactile sensibility upon the diseased side. You know that in cerebral hæmorrhage the paralysis may include the whole of one side of the body, or it may be limited to some particular muscle or sets of muscles. For instance, I have seen several cases in which the loss of power was confined solely to the leg, others in which the arm alone was involved, and still others in which either the tongue or the muscles of the face were paralyzed. Then, again, the disordered cerebral manifestations existed in the present instance for a long period before they

culminated in an actual attack, in which there was an effusion of blood in the brain-tissue. The difficulty in speech which this patient experienced was not, in my opinion, due to cerebral hæmorrhage, for, if this had been the case, it would not have disappeared so suddenly; but it is rather to be attributed to a sudden increase of blood to the brain, which was speedily relieved as soon as a sufficient amount of blood had been withdrawn from that organ. You will also observe that there were two well-marked attacks, which were separated from each other by an interval of over two years, and that these were both preceded by indications of increased cerebral circulation, which are very common precursors of cerebral hæmorrhage. In the case now under consideration you will notice that excessive physical exertion was the cause of the attacks, and consequently I consider the prognosis much more favorable than if it had supervened without any obvious exciting cause, for in that case we should have suspected in all probability that the cerebral vessels were seriously affected. In the four cases which I have lectured upon this winter, you will recollect that the attack was caused in all of them by excessive muscular exertion, excepting in the case of Fetter, whose paralysis came on during sleep.

In this connection I will briefly enumerate the most potent causes of cerebral hæmorrhage, to which I have not already called your attention. The disease is much more common among men than among women, although some authors have denied this fact. Then, again, there is supposed to be a special apoplectic constitution, but this has never been proved, as persons of sanguine temperament and plethoric habit are no more liable to cerebral hæmorrhage than persons differently constituted. One of the most common predisposing causes is undoubtedly hereditary predisposition. Of the exciting causes, a long list can easily be mentioned, and chief among these is season, for statistics show that the disease is much more prevalent in winter than at other times. Whatever tends to increase the flow of blood to the head, or to retard its exit, is capable of acting as an exciting cause of cerebral hæmorrhage, and under this head we embrace excessive mental and physical exertion, strong emotional disturbance, the excessive use of alcoholic liquors,

straining in the water-closet, tight clothing around the neck or abdomen, childbirth, vomiting, sneezing, and coughing, exposure to great heat, the fact that a patient has had a previous attack, and certain diseases, as syphilis, typhus fever, etc.

In regard to the prognosis, we should take into consideration the extent of the hæmorrhage, and the probability of saving life during the time of the attack and immediately afterward. In the apoplectic form *par excellence* of cerebral hæmorrhage, death almost invariably takes place within a few hours. In the less severe form of cerebral hæmorrhage which is attended with unconsciousness, and of which the case of Pope affords us an example, the prognosis depends upon the strength and age of the patient, and the conditions which produce the attack: thus in his case we should expect a favorable prognosis on account of his age, there being no organic disease of the blood-vessels of the brain, the attack being induced by severe muscular exercise while in the act of tying his shoe. You must also take into consideration the number of attacks, for the second is more apt to prove fatal than the first, and the third than the second. In the mild form of cerebral hæmorrhage with paralysis, which is not accompanied with loss of consciousness, the prognosis is very favorable especially after the lapse of eight days, when all risk of inflammation has passed.

In regard to the prospect of recovery from the paralysis, much depends upon the length of time that the condition has lasted, the opportunities which the patient has had for treatment, and whether strong contractions have taken place. In nearly all cases improvement takes place spontaneously, but after a while it stops, and then it is necessary to employ treatment if we hope to obtain amelioration. The extensor muscles of the upper and lower extremities are as a general rule the last to yield to treatment, and, even after all signs of paralysis have disappeared in the rest of the body, these still remain in a weakened condition. Even in cases where the amount of the hæmorrhage is small, the intellect may suffer to a great extent; in other instances the difficulties of speech may persist for a long time, as is illustrated in the case of Mrs. Fetter, although as a general rule these speedily disappear. Not only may the embarrassment of speech arise from pa-

ralysis of the tongue, the lips, or the face, as we have seen in some of the preceding cases, but they may be dependent upon the loss of the memory of words, or an inability to coördinate the muscles concerned in articulation. Again, all signs of paralysis may disappear in all parts of the body excepting the face, as we saw in the case of Eliza Gannon.

Respecting the pathology of this affection I wish to say a few words. In the majority of cases it will be found that the cerebral arteries are impaired by a disease which has been described by Virchow, and which was called by him chronic endoarteritis. This condition is induced by age or other influences which impair the nutrition of the cerebral vessels, although I believe that it is possible for a blood-vessel to rupture without its coats being at all diseased, in consequence of an increased tension of the blood or disease of the perivascular tissue. You are aware that the brain-tissue is less resistant than that of any other organ in the body, and consequently its vessels are not as firmly supported as in other structures. If the perivascular tissue be diseased, the natural support of the vessels is still further lessened and the tendency to hæmorrhage is increased. Then, again, we must take into consideration that certain diseases, such as typhus fever, syphilis, rheumatism, scurvy, chlorosis, and the like, which impair the general nutrition of the body, may also affect the blood, so that the cerebral vessels are not properly nourished. In the four cases which we have studied, you remember that one had suffered from typhus fever, two from bilious remittent fever, and one from rheumatism, and it is perfectly possible that these different diseases so affected the integrity of the cerebral vessels that their tissue was more readily broken down than it otherwise would have been if their nutrition had not thus been impaired, and consequently a less degree of tension was required to cause their rupture.

NOTE.—[The treatment in this case has consisted in the application of the primary galvanic and Faradic currents to the diseased muscles, and to the trunks of the principal motor nerves every alternate day together with a hypodermic injection of the thirty-second of a grain of the sulphate of strychnia three times a week.]

October 22, 1870.—The symptoms of cerebral congestion having commenced to make their appearance to-day, the patient was ordered to take fifteen grains of the bromide of potassium well diluted in water, three times a day, together with the application of the primary galvanic current to the head every alternate day.

October 28th.—The induced current having commenced to produce contractions in both the arm and leg, this was alternated with the primary galvanic. The muscles of the arm respond much better to the induced current than those of the leg.

October 31st.—The extensor and peronei muscles of the foot on the diseased side have improved to such a degree that they can be stimulated by a weak galvanic current. The muscles are pliable, and the toes can be moved by means of a strong Faradic current.

December 17th.—All the muscles are now readily excited by means of Faradism. The patient being unable longer to come to the hospital on account of her domestic duties, purchased a small Kidder's induction-machine, which she now uses at home. When last seen, in January, 1871, her leg had markedly improved, and she was able to walk very well; her speech was much more distinct, and she could move her tongue with greater ease; her arm had not improved in the same proportion as her leg, nevertheless some amendment had taken place. She could raise it from her side, and partially flex the forearm upon the arm, and she was also able to move her fingers voluntarily, but not to any great degree. The bromide of potassium had had the happy effect of causing the cerebral symptoms to disappear, and, after continuing its use for a period of three weeks, she was directed to stop using it. Subsequently these phenomena again made their appearance, and she was directed to continue the use of the bromide of potassium as long as they persisted. In January she informed me that she had ceased taking the remedy for some time, and that her head-symptoms had entirely disappeared.—T. M. B. C.]

HÆMATOMA OF THE DURA MATER.

¶ This peculiar form of meningeal hæmorrhage is the result of a chronic inflammation which takes place on the under surface

of the dura mater, and is generally situated in the neighborhood of the sagittal suture, so that it involves both hemispheres, and, as a consequence, the paralysis is bilateral. There is first the formation of a single membrane which is of a reticular structure, and owing to its great vascularity, for it is very highly organized, the vessels are easily ruptured; another hæmorrhage takes place, and another membrane is thus formed, and this process gradually goes on until twenty or more of these layers have become organized, and these different lamellæ thus constitute a sac into which blood may be poured, which, pressing upon the brain, and constantly increasing in size from subsequent hæmorrhages, give rise to well-marked head-symptoms, and gradually increasing paralysis. It is impossible to diagnosticate the affection with certainty during life, as it is so generally associated with other cerebral diseases that its symptoms are more or less obscured; nevertheless, by the process of exclusion, we may form a diagnosis which a *post-mortem* examination may subsequently verify.

CASE IV. *Hæmatoma of the Dura Mater*.—"Captain C., aged forty-five, married, and father of six children, a native of Massachusetts, has ever since his youth followed the sea for a livelihood. Endowed with a good constitution, and temperate in all his habits, he has been quite free from disease. When twenty-five years of age, however, he had an attack of intermittent fever, from which he speedily recovered, and about twelve years ago he had pleurisy, which was brought on by exposure. He has no hereditary predisposition to diseases of the nervous system, nor has he ever had syphilis, rheumatism, or any other affections excepting such as were the result of traumatic causes. His father lived to the good old age of ninety-seven, and his mother died of puerperal fever when thirty-five years old. One of his children is at present suffering from chorea. Some seventeen years ago, in a severe gale at sea, he went aloft to cut away some spars which were hanging by the rigging, when he was thrown violently into the top, striking on his head. He was immediately taken down in an unconscious condition, in which he remained for

some time, and when he regained his senses he found that his ship had been abandoned, and that he was on board of another vessel. On examination it was found that he was not only suffering from concussion of the brain, but that he had also received severe wounds of the scalp, together with a very bad injury of the right leg. After the effects of the concussion of the brain had disappeared, he was unable to walk, on account of the injury to his leg, from which he has never entirely recovered, and even at the present time he is somewhat lame. Subsequently to this accident no head-symptoms were developed, and with the exception of his lameness he was quite himself again. He enjoyed excellent health until

February, 1870.—At this time he was at Darien, Georgia, when one evening while returning to his vessel he was assaulted and severely beaten by some negroes, who left him in an insensible condition. In this state he was found, with severe scalp-wounds on the right side of his head, and more or less contusion on the left. There was also hæmorrhage from the right ear, which continued for several days. He was removed to his vessel, and on the third day became delirious, and remained so for a week. On the tenth day he became rational, and on the twelfth he was up and about, attending to his duties.

At this period his friends noticed that his speech was more or less affected, and he was aware of a general paresis of his upper and lower extremities. He was more or less deaf in both ears, his memory was impaired, and his ideas were somewhat confused. There was no facial paralysis, and no difficulty of sight. He now gradually improved from day to day, and his symptoms were slowly disappearing, when in August, 1870, he commenced to suffer from vertigo, which went on increasing in severity until it became so severe that he was unable to arise from the recumbent position, or turn over in bed, without augmenting it. He also had a dull, circumscribed headache, was stupid, and had a tendency to go to sleep at any time. The vertigo was more marked in the morning than in the evening. There was no nausea or vomiting. Such was the history of this patient up to the time he was admitted to the New York State Hospital for Diseases of the Nervous System, when his condition was as follows:

“There is a general paresis of both sides of the body, with a marked feeling of weakness in the knees. Tactile sensibility is greatly diminished everywhere, excepting in the integument of the head. There is a want of coördination in the muscles of the tongue, as evinced by the patient's stammering. The tongue does not deviate, nor is it restricted in its movements. There is no paralysis of the face. His hearing is now very good. His pupils are natural and equal on the two sides. His memory is little if any affected, and there is no noticeable confusion of ideas. His eye-sight is unimpaired. He still has severe vertigo, with a tendency to drowsiness, and a constant, dull, circumscribed pain in the head. He is cachectic and anæmic. There is no disease of the heart, and the lungs are perfectly healthy. The tympanum on the right side is not ruptured. The bladder and rectum are normal, and the urine is natural. The ophthalmoscope reveals an anæmic condition of the retina, the choroid is pale, and the retinal vessels are small, straight, and diminished in number.”

This case illustrates so well the symptoms that have been observed in hæmatoma of the dura mater, that, if this man should die, I should not be at all surprised to find, upon *post mortem* examination, the lesions which characterize this affection, the pathology of which I have already briefly described to you. From the history of the case we learn that this man received a fracture of the base of the skull, which was the result of traumatic causes, and that this was accompanied by meningeal hæmorrhage. I think that we can in no other way explain the hæmorrhage which took place from this man's ear for several days, except by attributing it to fracture of the petrous portion of the temporal bone, which you are aware generally suffers in injuries involving the base of the brain. Then you will remember that Captain C. became delirious on the third day after the accident, which shows that he was suffering from inflammation of the brain, which terminated in the course of a week in resolution, for, when inflammation of the brain takes place, it either causes death by its extension from the site of the lesion to other parts of the brain, or it goes on to the formation of an abscess, or it ends as it has done in the present instance. The symptoms after this attack were those which

we should expect to find in a person who had had an extravasation of blood at the base of the brain, and, as this was absorbed, these manifestations gradually disappeared. Then he began to suffer from vertigo, a dull, circumscribed pain in the head, and stupor. These phenomena were undoubtedly due to a chronic inflammation which had been taking place in the brain for some time. In hæmatoma of the dura mater we also have the power of motion diminished on both sides of the body, but never to a very great degree, and this was the case with Captain C., as you will observe that he walks very well, although he says he is weak in his lower extremities and particularly in his knees; and, when I ask him to grasp the dynamometer, you notice that he does not turn the index as far as a man who has the normal strength in his hands should do. When he speaks you will observe that there is a hesitation in his articulation, which is not due to paralysis of the tongue, for he is able to move this organ with facility in all possible directions, but is dependent upon a want of coördination in the lingual muscles. There are also present at this time vertigo, circumscribed pain in the head, and a tendency to drowsiness, which show that the disease is still active. Jaccoud has called attention to certain phenomena in this disease which he believes are sufficient to indicate its presence. Among the most prominent of these are the absence of fever, the contraction of the pupils, slowness and irregularity of the pulse, the severe and constant headache, and the increasing tendency to stupor, conjoined with the negative facts that there are no facial paralysis, no vomiting, and no general convulsions. These phenomena are all well illustrated in the patient before you, with the exception of the contraction of the pupils, as I find upon examination that they are about natural as regards size, and the slowness and irregularity of the pulse, which do not exist at the present time in Captain C., whose pulse is rather accelerated and weak. From all of which considerations I am inclined to the opinion that this man is suffering from hæmatoma of the dura mater. You know that this disease is found most commonly in children and very old persons, and that it may be induced by injuries of the skull, the excessive use of alcohol,

and fevers, and consequently it may occur at any age of life. The prognosis is unfavorable, the patient passing into a state of coma, which soon ends in death.

The treatment merely consists in palliative measures, as nothing can be done to cure this affection.

[NOTE.—This patient was treated by means of the internal administration of a sixteenth of a grain of the bichloride of mercury, and ten grains of the iodide of potassium, in the compound tincture of cinchona, three times a day, without any amelioration of his symptoms, and, the vertigo and pain in the head, after this remedy had been tried two months, becoming more severe, a seton was passed deeply through the nape of the neck, from which he for a time experienced some relief, and the mercury and potassium were discontinued. But in a short period he felt as bad as ever, and another seton was then inserted into the nape of the neck, and the primary galvanic current was passed through the brain three times a week, one pole being placed on each mastoid process, and then one pole on the forehead, and the other on the nape of the neck. After the lapse of a month he became discouraged, and was discharged, his disease having undoubtedly increased while under observation. T. M. B. C.]

ART. II.—*Epilepsy and its Relations to Insanity, and Cases of Doubtful Responsibility before Judicial Tribunals, with Remarks on Expert Testimony.* By A. O. KELLOGG, M. D., Hudson River State Hospital, Poughkeepsie, N. Y.

THERE are no cases of greater interest, either to the psychologist, the medical jurist, or the ordinary philosophical observer, than those obscure, irregular, and often singularly-manifested forms of insanity which complicate or are associated with epilepsy—none that have given rise to more dispute before courts of justice, or lead to more erroneous charges and decisions on the part of judges and juries. Touching the responsibility of many of these obscure cases before the law, there have been and are now, and, until they are bet-

ter understood, will continue to be, wide diversities of opinion. So contradictory is sometimes the evidence of medical men and "*experts*," and so divergent their views touching the same phenomena, indeed, we are sorry to say, so *ex parte* is sometimes their evidence, leaning manifestly toward the side of those who called them and paid them, that we have been ready to blush for the calling to which we belong, and have entertained the desire to leave the whole subject to the learning of the judge and the common-sense of the jury. A moment's reflection, however, and the recollection of decisions that have been made heretofore, teach us that this would be to render confusion still more confounded; and, if a correct decision is arrived at under such circumstances, it would be more the result of a happy accident than of any logical deduction from the facts and phenomena deduced.

The great difficulty and obscurity which surround and complicate such cases have not, we are pained to say, called forth that good will, that forbearance, and Christian charity which "thinketh no evil," on the part of either of the learned professions concerned in the investigation, which it would be desirable to see, and hence those gladiatorial displays of intellectuality sometimes witnessed before courts of justice, repugnant alike to good taste and kindly feeling, if not subversive of justice. These combatants have sometimes appeared to us like those theologians satirized by Butler in his "*Hudibras*," who sought, "To prove their doctrine orthodox by apostolic blows and knocks"—with this difference, however, that the "blows and knocks" were in most instances neither apostolic, nor scientific, witty, nor wise.

It has sometimes appeared to us that even if the history of our jurisprudence, during the last decade or more, is well and faithfully written, it will look very strange to our successors of fifty or one hundred years hence.

That portion of it which relates to the jurisprudence of insanity will certainly be rich in the extreme to them, and call up smiles and blushes, if not tears.

Our successors will no doubt be moved by the same feelings with which we now regard the trials for witchcraft, and will say of us as we now say of our ancestors, "There were

strange men in those days, and strange delusions sought after." There will be this wide difference, however, between us and them, which, to point out even at this time, needs no special prophetic power, viz., that with them, with all their ignorant superstition and cruel bigotry, there was an element of honesty, and as grim a determination to do justice to offenders as they understood it, as there is with us to undo it. At all events, the length of the prisoner's purse never determined, as sometimes with us, the question as to whether he was whipped or unwhipped of justice. Let us look at ourselves in connection with this subject for a moment, for it may be profitable at least to make the attempt to see ourselves as we may appear when the light of history comes to be cast upon us. As we do this, our minds, like that of the justice in "As you like it," if not filled with "wise saws," will certainly be with "modern instances."

A fearful crime is committed by a poor wretch, and for a time society is shocked and stirred up from its depths. In the heat of popular indignation blood is demanded, and, as the administration of justice by due course of criminal law is too tardy to meet the popular demand, lynch-law is resorted to, and the unfortunate, who may really be an epileptic or a homicidal lunatic, acting from the impulse of delusion incident to his dreadful disease, is shot down like a dog, or hung up to the first tree or lamp-post, uttering his insane imprecations and enumerating his wild delusions, perhaps with his last breath. Such cases are on record, and we need not go far back in the history of our jurisprudence to find them.

Let the criminal, on the contrary, belong to what is called the higher walks of society, and have ample means for a complete defence, and what do we see? Let him be got safely into jail until the first popular outburst has subsided, and his learned counsel and the "experts" will look well to his future interests. These counsellors are not slow to determine what is likely to be the most successful line of defence, and epilepsy or insanity is fixed upon, and they at once set about collecting the evidence on which to ground their plea. In the language of Slender, the history of "all his successors that have gone before, and all his ancestors that come after him" is ransacked

in order to find if the insignia of either of these ancient and honorable diseases were ever inscribed upon the family escutcheon, and as a result it is found that a maternal grand-aunt was epileptic, a paternal great-grandmother was actually insane, that his mother had hysteria after he was born, and that the accused himself had sometimes suffered depression of spirits, many times exaltation from spirits, amounting to mania in some instances, and that once he had an attack of delirium tremens followed by "fits." This is deemed sufficient to commence with, inasmuch as there are many precedents recorded in which this line of defence has been successful on evidence much less positive, touching mental disturbance and irresponsibility, than what is discovered, and is pertinent to the defence of the accused. The court is convened, and the plea is entered in due form. One learned doctor, who has made insanity the specialty of a lifetime, is called for the defence, and another equally eminent for the prosecution. They look askant at each other as they buckle on their learned armor, and prepare for the contest with each other, as well as for the fiery ordeal already kindled for them by the opposing counsel.

Poor men, were they not well paid, they are to be pitied; but money blunts sensibility, and dulls the keen edge of wit and sarcasm.

One expert thinks, from the testimony brought forward, that there are undoubted insanity and irresponsibility in the case; the other, basing his opinion on the same evidence, is positive in the contrary opinion. The judge is puzzled and perplexed, and the jury befogged, by the contradictory opinions of the *eminent and distinguished experts*, put forward by the opposing counsel, and as a *dernier ressort*, perhaps, they fall back upon the medical and psychological skill and experience to be drawn from practitioners in the surrounding rural districts. But we need not follow their testimony here, or speak of the enlightenment to judge and jury which follows from it. Is it not all faithfully and fully reported in the columns of the daily press, and preserved carefully for the benefit of posterity in the pages of the *PSYCHOLOGICAL JOURNAL*, and the *American Journal of Insanity*?

But it is not of medical or expert testimony in the abstract,

let it be well understood, that we complain, only of its abuse and misapplication in the hands of selfish, dishonest, and unscrupulous men, and those learned counsellors who, determined to win at all hazards, and by all means, fair and foul, thus make use of them. We place a proper estimation on sound, honest expert testimony, as we trust we shall be able to show, by the cases we propose to bring forward here, and the comments we shall make upon them.

The first case we shall call attention to, came under the observation of the writer several years since at the State Lunatic Asylum at Utica. A gentleman of good education, fine intelligence, and of great business activity and capacity, had been the subject of epileptic seizures for about ten years. The fits were of a peculiar character, and accompanied by some strange and interesting phenomena, among which a sort of double consciousness was the most curious. When an attack was approaching, he would stop suddenly in his walk in the hall, clinch his fists, and remain in a fixed position, his eyes turned upward, as if gazing steadily at some object on the ceiling, or some elevated point before him. During this fixed, wild stare he would gnash his teeth, and sometimes froth at the mouth for an instant. Ordinarily he did not fall, but at times did so suddenly and heavily, and for a few moments only would be entirely unconscious. At the moment of attack, and while standing motionless like a statue with the fixed gaze spoken of, if any one interfered to prevent him from falling, he would sometimes deal them a severe and stunning blow, or kick with his foot, or seize them and fall upon the floor as if in a struggle for life. In this way several attendants were badly injured. One was so severely bruised and had his thigh so injured by a fall of this kind under the patient, that the effect is still felt at times, after the lapse of several years. So fearful were the attendants of him at these times, that few would approach to support him when likely to fall, but stand at a distance from him, ready to lend any assistance they could with safety to themselves. In a few moments he would appear to recover completely his consciousness, and would converse rationally and intelligently, as though nothing had happened. Aside from unusual excitability, petulance,

and a desire not to be interfered with in any way, he seemed himself for several days following the fit, but, from curious inquiries made perhaps at the expiration of a week, it would seem that, notwithstanding his intelligent conversation, he was not fully conscious of what he was doing or of what was going on about him. At such times he would write many letters, and these letters were every way correct, showing no evidence whatever of delusion or any trace of insanity. Basing an opinion on these letters, the most experienced expert could not predicate insanity.

During this period he would positively refuse all medicine, and become much irritated if it was urged upon him, and, if force was attempted, he became furiously violent, and at once ventilated the delusion that we were enemies and assassins, and wished to kill him by poison. We fully believe that he would have killed any one, by any means in his power, who at these times sought to force his medicine upon him. At other times, when this condition had passed, he would take his medicine (bromide of potash) regularly, and would even be disappointed, and call for it if his cup had been for once accidentally left off the medicine-tray. When his fits of sullen obstinacy and refusal had passed, he would ask curiously if he had had one of his paroxysms, had behaved badly, refused medicine, or *written any letters* during the past few days; for the derangement of the usual orderly condition of his writing-desk, and the diminutions of his supply of stationery and stamps, led him to think he had been writing, though he had no recollection of doing so whatever.

One of the most marked and curious illustrations of this apparent double consciousness in the case of the gentleman is the following:

Once, when seized with an unusually severe attack, he fell suddenly and heavily to the floor, striking his head and cutting it somewhat severely, at the same time throwing the weight of his body on the palm of his hand, extending it violently back upon the forearm, and fracturing the lower extremity of the radius near the wrist-joint. He appeared to recover his consciousness as usual in a few minutes, but did not seem to suffer any pain, as would be supposed from the

violent extension of the wrist-joint and the fracture. He held out his arm for the doctors to examine it, did not complain of their manipulations, and never made suggestions as to the application of dressings. He appeared natural, though somewhat taciturn and irritable for several days, carrying his arm in a sling without any complaint of pain, or making any particular remarks about the limb, or what had happened. On the fourth day from the date of the accident, he called the attention of his attendant to the cut on his head and the bandages on his arm, and asked curiously what had happened—if he had not been in some row and got severely beaten; and he could scarcely be made to believe that in a fit of his malady he had fallen, bruised his head, and broken his arm, as he declared positively that he had no recollection whatever of what was represented to have happened to him during the past few days. He now began to suffer pain in the injured wrist for the first time.

During these periods of unconscious forgetfulness, his appetite was ravenous, and, notwithstanding his delusion of being poisoned by enemies—these prevented him from taking his medicine—he would, if allowed, indulge in the most indigestible articles of food, such as dried figs, raisins, candies, and maple-sugar in large quantities. At other times he would not touch these things. Such has also been the case with other epileptics, to whom we shall refer as we proceed with our inquiries.

At times the patient was very social, interesting in conversation, and intelligent and most gentlemanly in his intercourse with others. At these times he was a general favorite with all with whom he came in contact, from the medical staff down to the last poor patient who had been sent in the hall to complete his convalescence. At these times his society was courted and enjoyed.

At other times, for a day or two before or after his fits, he was irritable, morose, petulant, fault-finding, and in many ways disagreeable; so much so, in fact, that those who before had courted his society, now shunned him as they would pestilence or hydrophobia, as all seemed to feel that at such times he was dangerous, and to be left alone.

Touching the responsibility of a case like this before the law, the whole matter would hang upon the precise condition of the patient at the time of the act. The fact that he was an epileptic, and even at times insane and unconscious of what he was doing, should not, we think, impair his responsibility at other times; for most of the time he was not only rational but fully conscious of his acts and their consequences, and, committing murder at these periods from a *motive*, and not, as at other times, under the influence of *delusions*, he should be held responsible for his acts, and suffer the consequences of his crime. We know there are great difficulties to be met here, especially in determining the precise time of transition from the state in which the faculties are controlled by disease and delusion to that which follows, but these difficulties are not wholly insurmountable, if met with honesty and determination. The existence of epilepsy *per se* should not be held as an excuse for crime; this is a disease quite as independent of insanity as many others. Insanity is indeed very prone to arise in the course of it; it may be engrafted upon it, as upon phthisis, either as a sequence, symptom, or concomitant, but it is not the disease itself. Had this patient committed homicide while resisting his medicine under his delusion, he would have been clearly irresponsible; at other times we see no reason to doubt his complete responsibility.

G. W. P., aged forty, was admitted to the Hudson River State Hospital, March, 1872. He had suffered attacks of epilepsy for ten years, attacks coming on once a month regularly. He was single, and lived at home with his mother and a maiden sister, and the relations of the family had always been of the most kindly and affectionate character. Another sister, a widow, lived at a short distance from the homestead.

Laboring under the excitement of some law proceedings during the previous week, aggravated by a paroxysm of his disease, he became maniacal.

Patient had been quite unwell for several days, and the widowed sister had remained at home with the other sister and mother, to assist in the care of the epileptic brother. He occupied a room opening into the sitting-room, on the floor of which the sisters had arranged a bed, in order to be on hand

to attend to his wants; the mother also occupied the same room.

About 4 A. M., patient got up and said he was going to stop the clock, as its ticking annoyed him and prevented his sleeping; after stopping the clock he returned to his room, but did not remain there long. He got up again, opened the door of the sitting-room, and fell flat, or threw himself on the floor, with arms extended. The sisters and mother were much alarmed, and, raising him up, carried him to their bed and laid him down. The mother sat on the bed to be ready to attend him, and the sisters went into the patient's room and laid themselves down on his bed.

They had not been there long before the patient, who had in the mean time lost his mental balance and was now possessed of the demon of murder, started up from the bed and seizing a fire-shovel went to the room where his sisters were. He shouted out as he approached them, "I'm going to kill you both; the next place I will meet you is at the bar of God," and commenced striking them on the head with the shovel. Then throwing that down, he seized each by the throat and tried to choke them to death. The mother went to help them, but was unable to render much aid, being old and infirm, and she received some injuries in the struggle.

The sisters succeeded in making their way out to the sitting-room, and here another fearful struggle commenced, the three women shrieking in vain for aid, no house being near, and the maniacal brother loudly uttering his threats of murder. In the contest the stove was overturned and the house set on fire.

At length the sisters succeeded in breaking away from the murderous grasp of the brother, and fled from him, Miss P. running out at the front-door, and Mrs. C. starting through the kitchen to gain a door in the rear of the house. The patient pursued Mrs. C., and, having got a razor out of a bureau-drawer, he overtook her just as she had got the door open and was starting to run.

Here another horrible struggle took place, the brother trying to cut the sister's throat, and she battling for life. In the effort to get the razor from him she received two severe cuts, one in the right arm, just missing the main artery, and the other in

the hand. He drew the razor across her throat, making a terrible gash, laying bare the trachea and the root of the tongue, and narrowly escaped the main arteries. Had the cut been inflicted an inch lower, the force with which it was given would have severed the arteries and caused almost instant death.

A neighbor coming up at this time knocked the brother down, and after another struggle managed, with the help of his young son and Miss P., to secure the patient. But it took their united strength to hold him, and they feared that Mrs. C. would bleed to death before other help could arrive.

At length, however, more of the neighbors came, the patient was tied, and Mrs. C. was cared for. She had made her way into the house after receiving her wounds, and the sister, knowing that the building was on fire, was afraid that her mother and sister would be burned up, but the flames were soon extinguished, and all danger from that source was averted.

On admission patient was noisy and violent, striking attendants severe blows. Said they had murdered his mother, and were now, as he expressed it, "after his poor carcass." Talked loud and in the tone of a ranter; said God would call his enemies to justice. He continued in this condition for ten or twelve days after admission, when he became more quiet, and began to take food, if allowed, in enormous quantities, and would suffer indigestion, with regurgitation, acid eructations, and gastralgia. On the 29th and 30th of May following he had severe epileptic convulsions; after these he was quiet, sleepy, and taciturn. On the 10th of June he was removed home, contrary to advice, by the sisters on whom he made his murderous attack. He recollected nothing of having used the razor, and, when he saw the account of the transaction in an old paper he picked up in the ward, he was much agitated, inquired anxiously after the condition of his sisters, and denied all knowledge of the transaction, for which he expressed great and apparently unfeigned sorrow.

We are confident that much of the dangerous violence of persons in epileptic mania results from the delusion of fear of injury to themselves, and the necessity of acting vigorously in

self-defence. Indeed, so common is the delusion that they are being pursued by enemies with intent to kill, that it may be considered almost a characteristic symptom of this form of mania. That peculiar expression of countenance, a sort of blending of fear and suspicion, which all who have seen much of this disease must have observed, points, we think, to this delusion. Sometimes the patient, after recovery from the fit, is conscious of having been animated by this suspicion and this fearfulness of injury; but in most instances, according to our observation, this is not recollected, but forms a part of the blank oblivion in which every thing for the time being is shrouded.

A. W. V., aged twenty years, was admitted into the Hudson River State Hospital, June, 1872. For a number of years he had been the subject of epileptic attacks. He would fall and be unconscious for a time, but not convulsed, breathing stertorous. He would continue in this condition of sleepy unconsciousness for several hours before coming to himself. For nine months previous to admission he had not suffered an attack, but a few days before coming he was beaten severely about the head by a person with whom he came in contact. The fits then returned, and he became furiously maniacal and violent. He ran naked into the streets, screaming wildly, as if animated by the fear of some great calamity. He climbed up on the porticoes and roofs of houses, and when the police approached to arrest him became very violent, striking, biting, kicking, and screaming "Murder!" Before his arrest he had made an attempt to hang himself in his suspenders, and was cut down. He quieted down, and when brought to the hospital had a stupid, confused, and suspicious look. He answered questions slowly, but, aside from pointing out severe pain of the head, could give little or no account of himself. He had been bruised severely about the head, and said men had been after him to murder him.

The next day after admission he was more comfortable, composed, and reasonable, and took food moderately, which he had refused, probably under the delusion that it was poisoned. The third day after admission he was sent to the convalescent ward. He was quiet and gentlemanly, was visited by his

wife and friends, and showed no evidence of mental disturbance. On the 29th, twelve days after admission, he left for home with his wife, apparently in his usual health. Before leaving the office with his wife on the day of his discharge, we questioned both closely respecting the phenomena attendant upon the fits, and the sensations and delusions experienced, and elicited from them very intelligent, satisfactory, and, we are confident, correct replies. His wife, who had attended him through many of his paroxysms, and watched him carefully, stated that his chief animating delusion at these times was one of fear. He seemed to think that he was pursued by ruffians, who wished to murder him. He would watch closely people that approached him, and move away, keeping upon them a keen, penetrating, and suspicious look. If she or any one else came too near him, he became furiously violent and dangerous; this state, she said, would last from a few moments to half an hour, sometimes for an hour, seldom longer. He would emerge from this condition, as he entered it, instantly, and make inquiries how long it had lasted, and what he had done during the time. His wife asserts that she is confident he did not recognize her during these periods, and was as likely to make a violent onslaught upon her as upon any one else that came near him. After coming to himself he had no recollection of the delusions of fear that had animated him, but, at the same time, had a distinct remembrance of certain physical symptoms which preceded and followed the attacks. It appeared, he said, as if a sudden blindness would come over him. A mist seemed to hang before his eyes, and his head appeared heavy and as if constricted by an iron band. He said he felt as if the skull were too small for its contents.

He also experienced shooting pains about the præcordia, attended by difficulty of breathing; on looking for a length of time at an object, he would experience a sensation of giddiness, and he did not feel natural in the head sometimes for hours after his attacks.

Before these attacks his appetite would become voracious, and afterward he would suffer severely from indigestion, acid, eructations, and gastralizations, with at times regurgitation of food.

A patient now in the Hudson River State Hospital was, for some time, the subject of epileptiform seizures; he was apparently unconscious for ten or fifteen minutes, but there were no spasmodic movements. He described the approach of the fit as being accompanied by dizziness, with a sensation of what he described as "rushing of blood to the head." He says at those times the power of motion was denied him, and he was commanded by God to stand still, as Joshua commanded the sun and moon. These attacks sometimes lasted from half an hour to an hour.

This patient also experienced at times hallucinations of hearing. At night he said he heard bells ringing, whether asleep or awake, but never heard the sounds by day. At times his fits have apparently been supplemented by paroxysms of violence, during which he would strike any one that came in his way. At one of these periods he spoke wildly and incoherently, calling himself a king, and demanding from those about him the homage he considered due his exalted position. This patient, not long since, passed through an attack of acute articular rheumatism, and since his recovery from this he has had no epileptic seizure, but remains quiet, taciturn, and feeble-minded, but otherwise comfortable. He took formerly much bromide of potassium, but for two months or more he had never taken the remedy, so that his freedom from seizures similar to those described above cannot be ascribed to the influence of this useful epileptic palliative.

We see no way of dealing with such cases as we have here brought forward, where the question of responsibility comes up before a judicial tribunal, than by a careful, intelligent, honest analysis of all the facts, circumstances, and conditions, by one who has made careful studies of many cases, and is fully acquainted with the strange, curious, and apparently contradictory phenomena they present. Such an analysis will, we are confident, bring out the truth touching the responsibility or irresponsibility of most cases. Herein consists the importance of honest, careful, and experienced "expert" testimony, the value of which, in the administration of justice in all such doubtful cases, cannot be overestimated. Upon it will sometimes depend the life of a fellow-creature, and the safety, not

only of his immediate friends and family, as we have seen, but the entire community surrounding him.

ART. III.—*The Physiology and Psychology of Dreams.* By
JAMES J. O'DEA, M. D., Clifton, Staten Island.

PART I.

THE PHYSIOLOGY OF DREAMS.

THE nervous system of man is composed of two physically-distinct substances, named respectively gray or vesicular, and white or fibrous matter. The former constitutes its central and transmuting, the latter its peripheral and transmitting part. Through the one the phenomenal world acts upon him; by means of the other he can react upon the phenomenal world. Both are prerequisites to his existence as a sentient, conscious, and willing being; for, deprived of the transmuting laboratory comprising the central gray tract of his nervous organism, he could neither originate nor direct his own movements, and without the transmitting fibrous portion thereof he might indeed will movements but could not execute them.

It is not necessary that we should here concern ourselves with the evolution and growth of these physically-distinct parts of a mutually-dependent whole, our purpose being sufficiently served if, from a general survey of their differences of molecular arrangement and function, we can gain help for a study of dreams founded on a physiological basis.

We begin with the gray central part of the nervous system. This is known to consist of a nucleated protein-substance, studded with minute granules of fat, the whole enclosed by a very delicate transparent membrane, so extremely fine as to be sometimes invisible, even with the aid of the highest magnifying powers. In physical appearance this enclosed compound is a semi-diffuent body, being indebted for this character to its fat-granules, and a very large percentage (about 88) of water. The molecular arrangement resulting from this admixture endows it with a great degree of sensitiveness, for it is now known that the susceptibility of any

organic tissue to molecular change is in direct proportion to the amount of water entering into its composition.

The components of white or fibrous nerve-tissue are similar to the above; but, being differently arranged, they have a dissimilar function. The axis-cylinder, or central thread of a cerebro-spinal nerve-fibril, is a protein-substance like to the basic contents of the nerve-vesicle, but more compact and continuous. Particles of fat are not dispersed through it to break its uniformity, or give its molecules great mobility. It is the essential part of the nerve-fibril, without which there would be no transmission of nerve-force to and from the gray centres, or between these centres themselves. It has the two essential conditions for its office of transmission, namely, continuity of substance and stability of form, the former insured by its compact line, the latter by its non-oleaginous character and comparative dryness—nerve-fibrils containing some 25 per cent. less water than the gray central tissue already mentioned.

The differences in susceptibility to change respectively, manifested by these two structures on account of their dissimilar molecular arrangements, may find a tolerably apt, though homely, illustration in the common fire-cracker. The fire applied to the end of the fusee travels gradually up its compact length, until it reaches the very sensitive and easily-decomposed gunpowder in the paper barrel. Here the previous comparatively slow communication is converted into a rapid disintegration, resulting in the well-known explosion. Thus it is with the two parts of the nervous organism now under consideration; the transmission of an impression along a nerve-fibril is accomplished by a wave of change in its axis-cylinder, commencing at one end and after an appreciable interval terminating at the other.¹ The immediate result of this wave, as manifested in the central gray matter, is a rapid, simultaneous disintegration of its molecules, resulting in one or more of the phenomena recognized as mind by some, as manifestations of mind by others.

Without venturing too far with the figure, we may discern another point of analogy between the fire-cracker and the

¹ The rate of transmission is about thirty-two yards per second, that of electricity being two hundred and eighty thousand miles per second.

nervous system, in the additional fact that the fusee, though burned, retains its continuity if undisturbed, while the paper barrel, representing the nerve-cell, being disrupted, its contents are distributed in space. Supposing the power of self-repair to inhere in the fusee, it might only need a rearrangement of its particles, to be fit to transmit fire again, while the barrel would require a reconstruction out of new though similar elements, before being restored to the conditions of its detonating power.¹ We may use this feeble analogy to illustrate, however imperfectly, the structural and functional differences between the essential parts of the nervous organism. The conducting or so-called fibrous part is comparatively stable; it performs its function by a change in the molecular arrangement of the axis-cylinder, impressed upon it from without or from within, after which it returns to the isomeric condition in which it was previous to its excitation. The central, or gray portion, on the contrary, is unstable and easily disrupted, and, when disrupted, undergoes more or less complete disintegration, necessitating renewal by the appropriation of new material of a homogeneous kind. This material it is the chief function of the circulating blood to furnish in sufficient quantity and proper quality. Assimilation from the elements it brings repairs the waste inflicted upon the nervous system, and, as this waste is in direct proportion to functional activity, it follows that the gray centres require a greater supply of nutriment, as well as greater facilities for its appropriation. We consequently find that these centres are furnished with a supply of blood many times more copious than any other portion of the body, and that it is brought almost immediately in contact with the cell-contents—the delicate wall of the vesicle, and the equally fine capillary tube, alone intervening. During the waking state, activity and waste, particularly of gray nerve-tissue, are at their height; repair goes on steadily also, but it is distanced by destructive metamorphosis. Nerve-substance is therefore wasting, and nerve-force diminishing, effects which would run into disease, were it not that Nature puts a gentle constraint upon us to take needful rest. This rest is sleep, a state which affords the

¹ Of course the analogy is merely used for the purpose of illustration.

best opportunity, both from its duration and the massive repose it insures, for repairing the ravages inflicted upon the central nervous system. Such, in brief, is the wise purpose of

"Nature's sweet restcrer, balmy sleep."

The approach of sleep is frequently heralded by a state of reverie in itself very refreshing. The writer has many times experienced a greater renewal of vigor after twenty minutes of this state in an easy-chair or on a couch, when suffering great bodily or mental fatigue, than if he had slept soundly for hours. The reason appears to be that, after a sleep following great fatigue of mind or body, there results a temporary degree of languor or stupor, which is not experienced after reverie, and yet the latter has all the advantages of sleep, since it insures complete rest of body, and a pleasing flow of mental images, which come and go without appreciable effort. It has been the writer's personal experience, whether or not it agrees with that of other people he is unable to say, that a light sleep, a couple of times interrupted by short periods of wakefulness, is a more refreshing night's rest than the profound lethargic state called "sound sleep."

Sleep steals upon many people gradually, the gradation being marked by the following stages:

1. The centres of sensation, wearied by their previous states of activity, cease to respond to stimuli coming from without. Light, sound, touch, pressure, no longer excite in them correlative sensations or movements.

2. Simultaneously, the images which were impressed on the sensorium during the day begin to emerge, and, now singly, now in clusters, engage the attention. They revive involuntarily, and group themselves upon the mental stage.

3. Until lost to consciousness by sleep they remain, and, by a peculiar method of association to be explained hereafter, undergo a variety of transformations, like the shifting figures in a kaleidoscope. They come and go at their own sweet will, in mien sportive or severe, and disappear only when sleep,

. . . . "that knits up the ravelled sleeve of care,

Steeps the brain in total oblivion."

Investigations into the physical phenomena of sleep have shown it to be preceded and accompanied by anæmia of the

brain, the stream of blood passing through its innumerable channels being diminished in quantity and slackened in speed. This, however, is really not an ultimate fact, but the consequence of a preceding change to which the physiological phenomena of sleep can be finally traced. This primary step in the chain of events accompanying sleep is exhaustion of nerve-force, consequent upon the severe strain put chiefly on the gray matter of the nervous centres by the uninterrupted demands of the day. After it the other appearances follow in succession. To quote the language of a remarkably close, logical and systematic reasoner, "The waste of the nerve-centres having become such that the stimuli received from the external world no longer suffice to call forth from them adequate discharges, there results a diminished impulse to those internal organs which subserve nervous activity, including more especially the heart. Consequently the nerve-centres, already working fully, are supplied with less blood and begin to work more feebly—respond still less to impressions, and discharge still less to the heart. And so the two act and react until there is reached this state of profound unimpressibility and inactivity."¹

Certain outer signs keep pace with this interior physiological change. There is, first, an initiatory stage of general weariness and relaxation, denoting a diminishing flow of nervous energy. Then the special senses begin to fail. If the occupation at the time be such as reading aloud, the printed lines grow blurred and run into each other;² words continue to be mechanically pronounced, but the sound of the voice is less distinct, and the sentences lose their meaning. Every little while efforts are made, as by rubbing the eyeballs, changing the position, etc., to stimulate the nervous centres to fresh discharges, but to no purpose, the tired brain lapses into snatches of complete oblivion; then tactile and muscular sensibilities are lost, the power of volition fails, the book falls from the hand, the muscles of the entire body relax, the frame droops, and the head leans forward on the chest; total uncon-

¹ "The Principles of Psychology," by Herbert Spencer, vol. i., p. 89, 1871. D. Appleton & Co., New York.

² The effect of diminished supply of nerve-force to the ciliary muscle.

sciousness of the external world succeeds, hallucinations and phantasms arise, and the individual is launched into a world of airy visions. Whence do these proceed? How can we explain the phenomena of dreams?

There are two rival theories of dreams: 1. The primitive, animistic, or supernatural theory, formerly universal among mankind, but now confined to uncivilized nations and the uncultivated classes of civilized society. 2. The modern physio-psychological, or rational theory, beginning with Aristotle, disappearing in the middle ages, and reappearing in modern times, amplified and confirmed by scientific research.

1. In the primitive view sleep was an objective influence, a shadowy form, which, descending upon the weary, steeped them in a kind oblivion of their cares. Dreams were the communications of the spirits or the adventures of the dreamer's soul; for, uncivilized man believed that the soul departed from the body in sleep, and experienced, in its wanderings, the incidents of the dream. As if to meet the obvious objection that, when the soul absented itself from the body in sleep, there could be no consciousness of such dreams as were communicated through the visits of supernatural agents, the North-American Indians invented the fiction of two souls in each person, one sensitive, the other rational. While the latter was out on its adventures, the former, they said, dwelt in the body, and received communications from *ultra-mundane* agents.

Dreams, as extra-corporeal adventures of the soul, are chiefly illustrated in the traditions and folk-lore of savage nations. We have room for only a few of the many examples of this phase of belief which might be quoted:

The New-Zealanders, the Karends, and the Tagals of Luzon, believe dreams to be the adventures of the soul after it has left the sleeping body. The Tagals object to disturbing a sleeper, lest he should be so unfortunate as to awaken before his soul's return. The same phase of belief is exhibited in the middle-age legend of King Gunthram: "The king lay in a wood asleep with his head in his faithful henchman's lap; the servant saw as it were a snake issue from his lord's mouth and run to the brook, but it could not pass, so the servant laid his sword across the water, and the creature ran along it and

up into a mountain; after a while it came back and returned into the mouth of the sleeping king, who waking told how he had dreamt that he went over an iron bridge into a mountain full of gold.”¹

As an example of the belief in dreams as supernatural communications, we may instance the negroes of South Guinea, who construe their visions of the night into “visits from the spirits of their deceased friends. The cautious hints and warnings which come to them through this source are received with the most serious and deferential attention, and are always acted upon in their waking hours. The habit of relating their dreams, which is universal, greatly promotes the habit of dreaming itself, and hence their sleeping hours are characterized by almost as much intercourse with the dead as their waking are with the living.”²

One striking fact confirmed, if indeed it did not originate, the belief in dreams as supernatural communications. The images which flit in the sensorium of the sleeper are referred to the outer extremities of their respective nerve-channels, and hence, becoming true hallucinations, wear all the appearances of reality. The visions which greet his sight, and the voices which sound in his ears, are to him actual objects of perception. The forgotten memories which suddenly revive in his mind, under the influence of external excitation or internal suggestion, have that air of mystery and unaccountability about them which, in the absence of psychological knowledge, forcibly suggests the theory of supernatural communication. Even tribes and nations who have made considerable progress in religious and political life are no exceptions to this belief. From the patriarchal age it may be traced through the middle period of Semitic history into the incompletely-civilized modern representatives of the Semitic people. “Should the present history of the country be written by an Arab scribe, the style of the description would be purely that of the Old Testament, and the various calamities or the good fortunes that have in the course of Nature befallen both the tribes and in-

¹ Tylor's “Primitive Culture,” vol. i., pp. 398, 399; from Grimm, D. M., p. 1036.

² J. L. Wilson, “Western Africa,” p. 395.

dividuals, would be recounted either as special visitations of Divine wrath, or blessings for good deeds performed. If, in a dream, a particular course of action is suggested, the Arab believes that God has *spoken* and directed him. The Arab scribe, or historian, would describe the event as the voice of the Lord (*Kallam el Allah*), having spoken unto the person ; or that God appeared to him and "said."¹

Although Tertullian, in his book "*De Anima*," shows glimpses here and there of a rational philosophy of dreams, he mainly holds to the belief in their supernatural source. He traces them to Divine or demoniacal influence according to their respective characters. And the same belief, intensified, if possible, by the religious character of the dreams of the period, can be readily traced through the middle ages. For in these ages dreams and visions of saints and paradise, but more frequently of demons and the regions of darkness, were the common visitations of the sleeping hours. The student of this chapter of history will recognize the appropriateness of the dreams of the time, when he learns how commonly the supernatural world, with its joys and terrors, furnished it with themes for deep and anxious meditation. For, there is no doubt that the general complexion of the visions of the night, and the interpretation of the "airy voices that syllable men's names," are shaped in accordance with the prevailing thoughts of the day. The examples at hand are abundant. Here is one demonstrating the influence of the then prevailing anxiety about the future state of punishment, on the incidents and character of a dream :

"Sunulphe, Abbot of Randan (Monastery of Clermont), told how he was conducted in a vision to the verge of a river of fire into which a crowd of people had just fallen. Some were up to their middle, others to their armpits, many to their chins. They cried aloud from the pain of their burning flesh. Spanning this river was a bridge so extremely narrow that one could scarce obtain a foothold upon it. On the opposite side stood a white mansion. Having asked his companions what it was intended for, they answered: 'They who carelessly discharge their priestly duties shall be thrown from this

¹ Baker's "Nile Tributaries," pp. 129, 180.

bridge, but the zealous and attentive shall cross it unharmed, and arrive full of joy in the mansion yonder.' And, hearing these words he awoke, and was more exacting of his monks."¹

2. The spirit of modern scientific research has emancipated dreams from the arbitrary dominion of the supernatural, by proving them subject to laws similar to those governing other bodily and mental phenomena, qualified in their working by some secondary differences due to certain peculiarities of the sleeping state.

According to the more rational theory of the present day, dreams are the present mental images of past sensations revived by subjective states of the dreamer or by objective impressions on his senses, and their principal factors are (*a*) bodily sensations, whether these be subjective or objective; and, (*b*) "our previous waking thoughts, dispositions, and prevalent states of mind."² These by their mutual interaction are quite sufficient to account for the diversified phenomena of dreams. And in every instance, however unlike any one of our waking mental states the integrated dream may be, it will be always found, on close analysis, composed of images and ideas derived from our waking experience, and to represent, under some form or other, what we have actually seen, felt, desired, or accomplished. So certainly is this the case, that we might with perfect confidence adopt a paraphrase of a famous saying as our motto, and declare that—

"Nihil in somnis quod non prius erat in sensu."

Only the former of these states will be considered here, the latter coming more appropriately under the psychological section of our subject.

The bodily sensations which excite dreams are too numerous to be mentioned here in detail. They may be described as coming from two chief sources, namely, the organs of vegetative life supplied by the sympathetic system, and those of animal or relational life, supplied by the cerebro-spinal system.

The central part of the sympathetic runs in two lines, like strings of beads, one on each side of the front of the spinal

¹ Grégoire de Tours, t. iv., ch. 38, Guizot, t. i., p. 189; quoted in Lannelle, "Curiosités des Traditions," pp. 57, 58.

² Seafeld's "Literature and Curiosities of Dreams," vol. i., p. 57.

column, from the base of the skull to the tip of the coccyx, where both unite and terminate in one ganglion. Throughout its course it has a ganglion corresponding to each vertebra of the body, and three in the neck. Each ganglion is connected with the viscera of the body, especially the heart, lungs, stomach, and intestines, by means of afferent and efferent nerve-fibres. Furthermore, each is also connected with the spinal nerves by two short trunks, one going to, the other coming from them, and thus establishing a connection with the cerebro-spinal system.

These details are given that we may the better understand how it happens that certain states of the visceral organs can, through irritation of the sympathetic ganglia, start a dream or influence its course and character. And the *modus operandi* is as follows: Peripheral irritation of the sympathetic excites molecular change in one or more of its ganglia, which, reflected back upon the spinal cord, is transmitted hence to the brain, and there excites a train of images constituting the dream. The irritation when it reaches the spinal cord may be all immediately reflected upon the muscles, thus exciting the involuntary movements of some sleepers; or it may travel up the cord, and be arrested in the *medulla oblongata*, where, reflected along the motor nerves supplying the respiratory apparatus, it causes the hurried breathing and increased heart-action of others; or, finally, it may continue in its upward flight till it enters the gray structure of the brain, and, through the molecular excitement it there occasions, produce dreams and the motor effects just now mentioned. The following example will illustrate this last stage of the process: A young gentleman, suffering from slight diarrhoea, went to bed one night, and had his rest disturbed by cutting pains in the bowels. He dreamed a great deal, his dreams being all variations upon one theme. He was engaged in a hand-to-hand encounter with half-savage people, who attacked him with sharp knives. In his efforts to ward off their blows, he received many deep and painful cuts on his hands and arms. In this example the irritation of a part supplied by the sympathetic was the primary cause of a dream in which, according to a

peculiar method of association of ideas, sharp instruments and painful cuts were the most prominent features.

Again, a person going to bed hungry has a dream that he is seated at a table spread with choice viands. He eats voraciously, but is never satisfied. Why? Because the image or feeling of hunger excited in the brain by the empty stomach is not checked by any subsequent feeling of satiety coming from the same source.

The sympathetic, though a very important, is not the only source of dreams. A very numerous and interesting class is occasioned by excitation of the peripheral expansions of the special senses. A gleam of light resting on the eyelids of a sleeper, an unusual noise sounding in his ears, an offensive or close odor, an unpleasant taste in his mouth, may each suggest a dream.

Examples of this suggestive power of the special senses are abundantly at hand, and many could be here quoted were it necessary. The following will probably be deemed sufficient:

A physician slept in a cheesemonger's overnight. A barrel of strong, old American cheese had been recently unpacked in the house, and its odor had strongly impregnated his room. In addition to this annoyance, just as he was beginning to feel very drowsy, he was disturbed by the noise of rats gnawing in the wall at the head of his bed. In spite of all, he at length fell asleep, and this was his dream: He was in a savage country, and, on account of some criminal act, condemned to be imprisoned in a huge cheese. Into it he was put, and one can better imagine than describe, as the saying is, how he suffered from the stifling atmosphere of the place. But the worst was yet to come. He had not been long a prisoner, when a legion of rats attacked the cheese. At it they went, tearing away with their horrible teeth until they pierced its wall, and were already gnawing at his flesh. In the midst of his agony he awoke to find it all a dream, but at the same time to feel that he was being made thoroughly sick by the disagreeable cheesy odor of his room.

The experiences of M. Maury¹ are further and very inter-

¹ L. F. A. Maury, "Le Sommeil et les Rêves," 3^e édition, Paris, Didier et C^{ie}, 1865.

esting illustrations of the suggestive power of the special senses. We give his experiments in an abridged form, referring our readers to the work itself for further particulars—a work which we take this opportunity of recommending to those who are not already acquainted with its great merits:

Tickling his nose with a feather caused him to dream that a pitch-plaster, which he imagined to have been put upon his face, was violently withdrawn, giving him acute pain.

A tweezers sounded close to his ear gave him a dream of the ringing of church-bells, and, by suggestion, the sound of the tocsin with images of the political events of June, 1848.

Eau de Cologne held to his nostrils made him dream of a perfumer's shop in Cairo, Egypt, in which he had formerly been.

A few drops of water sprinkled on his brow suggested a vision of Italy, a sensation of great thirst, and a cooling draught of Orvieto.

A red light carried before his closed eyelids gave him a dream of storm and lightning, suggesting also recollections of a tempest he had once experienced in a journey between Morlaix and Havre.

The suggestive power of muscular and cutaneous sensations, in the production of complicated dreams, is also amply attested. One may pass through a long attack of imaginary sickness, ending in paralysis from sleeping with an arm or leg in such a position that its nerve-supply is cut off by pressure, or be forced through a series of distressing adventures in a state of nudity, from the bedclothes accidentally slipping off. The sensation of the prick of a pin may give origin to a dream in which the actor is involved in a hand-to-hand struggle, and receives a fatal stab from his antagonist. "I have been told by a friend," writes Dugald Stewart, "that having occasion, in consequence of an indisposition, to apply a bottle of hot water to his feet when he went to bed, he dreamed that he was making a journey to the top of Mount Etna, and that he found the heat of the ground almost insupportable. Another person, having a blister applied to his head, dreamed that he was scalped by a party of Indians.¹

¹ Dugald Stewart, "Elements of the Philosophy of the Human Mind," pp. 245, 246, Cambridge, 1829.

In the early part of this paper it was implied that sleep commences in the gray matter of the brain, its immediate cause being an arrest of molecular action from exhaustion consequent upon the demands of the previous day. But exhaustion is not equally complete in every portion of the brain. There are always parts of cells or districts of gray matter, which, having escaped, for an unknown reason, a great deal of the wear and tear of the day, retain their irritability, and consequently their functional activity, if not entire, at least in part. A trifling disturbance, sent to them through the ever-wakeful axis-cylinder, arouses their molecular activity. The result, telling immediately upon the heart, causes augmented volume and rapidity of the blood-current. Foci of romora, or increased capillary action, are thus occasioned in the brain, which feed, as it were, the visions of a dream. Like live embers on the hearth, now one image glows and dies tranquilly away, now another. But, should the local excitement become intense and be discharged in a large wave on the heart, the cerebral vessels are made turgid, the dreams grow hurried and tumultuous, and a succession of riotous images results, of which there is little trace on awakening, save the general feeling of their confused and disagreeable character.

One little group of cells may, therefore, by this process of action on the heart, and reaction on portions of circumjacent cerebral cells, evoke molecular changes which on their mental side are felt as dreams. And it will depend chiefly upon the degree of regularity or irregularity with which these different centres of images act together, whether the dream is coherent and probable, or incoherent and absurd.

The intimate relation between this molecular change and the images evoked in the dream, we shall not attempt to explain. And, in fact, all beyond what we have already rehearsed, which is necessary to complete the subject from the physiological point of view, is to postulate the existence in the brain of images of past sensations and states of consciousness. These are what the final stage of molecular excitation revives, and out of them the dreamer spins the tissues of his dreams. Now, such images are constantly falling on the sensorium, where they fade away, like secret ink, to revive only under the influence of some appropriate stimulus.

De Quincey, in one of the fine essays forming the sequel to his "Confessions of an English Opium-eater," likens the brain to a palimpsest—an antique vellum parchment—whereon successive generations recorded their historic events, or the creations of fancy, the legatee erasing, as he vainly thought, the previously-written narrative to make room for his own. The same piece of vellum might thus be made to bear the text of a Greek tragedy, afterward a monastic legend, and finally, written upon both, the story of some mediæval romance. But, falling at last into the hands of the first ardent students of chemistry, its written treasures were discovered to be, like the maid in the gospel, not dead but sleeping, and a way was soon invented of bringing them to light again. Suitable reagents were applied, when lo! the scrolls, which had so long defied the scrutiny of the keenest eyes, were revealed, sometimes in the order in which they had been long ago written down, but oftener in a state of perplexing confusion and admixture. The brain is also a palimpsest. Softly and unperceived many layers of ideas fall upon it, melt into its substance, subside into a latent state, and so remain until evoked by the molecular excitement of the gray centres to which we have already alluded. Then when aroused, if the groups of gray elements in which they are centred are contiguous or co-ordinated in function, they come marching out in the order of their entrance, or, if these physiological conditions be the opposite, they rush out pell-mell like school-boys released from their tasks.

We have thus sought the hidden sources of dreams in the common physiological conditions of the body, and found them there. In a future paper it will be our aim to trace the psychological method, according to which the wonderful storyteller, a sleeping brain, weaves its romances.

ART. IV.—*Certain Queries in Electro-Physiology and Electro-Therapeutics.*¹ By GEORGE M. BEARD, M. D.

1. *Is it possible to affect Diseases of the Skin by Central Galvanization alone, without making any Application to the Diseased Surface?*

This query I am now in a position to answer decidedly in the affirmative. My conclusion is based on experiments made during the past year, in a variety of cases of diseases of the skin, some of which I have had exceptionally good opportunities to study, not only during the treatment, but subsequently.

Central galvanization is a term that I have applied to a method of using the galvanic current, in which the negative pole is placed at the pit of the stomach, while the positive is passed over the head, neck, and spine, in such a way as to bring the cranial contents, the sympathetic, the spinal cord, in short, the entire central nervous system as well as the pneumogastric, under the direct influence of the current.* Among my experiments with central galvanization in diseases of the skin are the following:

In the Long Island College Hospital, a very remarkable case of chronic eczema of the leg in a woman of middle life, of a most obstinate character, that had resisted all forms of treatment *for eight years*, was immediately relieved of the symptoms of distress and irritation by two applications of central galvanization, and in less than *a week* the appearance of the leg was greatly altered for the better. The disease had involved the whole surface of the leg below the knee, and was especially severe at the ankle, so that the patient could not bring her foot to the ground, and was helped about the ward with great difficulty. In six weeks the leg was nearly well, and the patient was able to go several blocks. In three months the portion of skin that had been diseased had become

¹ Extracted from a paper read before the Medical Section of the American Medical Association, May 8, 1872.

* I have previously described this method, in a general way, in the *New York Medical Record*, December 15th. The details of the applications will soon be published in the *NEW YORK MEDICAL JOURNAL*, when a comparison will be made between this and the ordinary method of using electricity, localized electrization, and general faradization.

smooth, except one small spot at the outer ankle. By June 25th, the patient was entirely well, and was discharged from the hospital.

A boy of eleven years of age, who for six years had suffered from general prurigo, with severe itching and pain, especially at night, was immediately benefited by central galvanization, and in *eight* weeks' application was nearly cured.

Both of the above cases were presented, at the different stages of their progress under treatment, before the medical class of the Long Island College Hospital.

A child, that was covered by patches of eczema over a large part of the body, was cured in two weeks by central galvanization.

Another case of general prurigo, in a woman of middle life, improved slowly, but yet decidedly, under the same treatment.

Two cases of acne, of very long standing, have improved appreciably, under central galvanization, after the usual remedies have failed. One of them was a young man whom I was treating for epilepsy. His back was covered with acne, and also the face, arms, and forehead. Central galvanization was used for the epilepsy, for three months, on the average about twice a week. At the end of that time, although the epileptic attacks were not entirely dispelled, the acne was so far benefited that the back was almost entirely smooth, and only a very few spots remained on other parts of the body. The other case, where acne has been the only symptom, is now decidedly improving under central galvanization, and is still under treatment.

A case of syphilitic eczema of the hands and feet, of long standing, was relieved and nearly cured by central galvanization, and then relapsed, and was again successfully treated by the same method. I may here remark that relapses of inveterate affections are possible, after this method of treatment, as after any other method; but it would seem that electrical treatment thus directed to the nerve-centres would achieve a more permanent cure than electrical treatment directed to the periphery alone.

A case under care of my assistant, Dr. Sterling, of obstinate and very long standing, lichen of the lower limbs, at-

tended with severe itching, was somewhat benefited by *local galvanization* of the diseased surface, but relapsed, and did not on the second trial yield to the same treatment. *Central galvanization* relieved the itching at once, and after three applications the improvement was so great that he discontinued treatment.

On the other side, it should be remarked, in a case of absolute and painful gastralgia, complicated with eczema of the anus, that was treated by central galvanization, the gastralgia yielded rapidly and permanently, but the eczema constantly *grew worse*, and about in proportion to the improvement in the gastralgia.

The subject is not yet wholly worked up, and many questions will arise concerning it that I am unable to answer; but if the future shall confirm the experience of the past in this matter, if other observers shall obtain the same results that we are continually obtaining in the dispensary, the discovery will be of inestimable value.

It will be of value to the dermatologist and to all who seek to relieve some of the most obstinate maladies of the race. It will be of value to the pathologist, who will here find an additional argument in favor of the theory that the centre of disease as well as the centre of life is in the nerves.

Finally, it will be of value to us, as explaining, in a most interesting way, the beneficial action of certain remedies, as arsenic, phosphorus, cod-liver oil, etc., in diseases of the skin.

2. *To what extent is it possible to affect the Cervical Sympathetic by External Electrization?*

Concerning the power of electricity to affect the sympathetic, and through the sympathetic to modify the circulation, there has been not a little difference of opinion among electro-therapeutists.

Two years ago I instituted careful experiments, with the coöperation of some of the leading ophthalmologists of New York, to see what effect galvanizing and faradizing the neck (placing the electrodes in such a position that the current in passing from one to the other must traverse the cervical ganglia of the sympathetic) would have on the retinal circulation.

These experiments, which have been since frequently repeated with different individuals, with different strengths of current and with different batteries, seem to me to demonstrate the following propositions:¹

1. Galvanizing or faradizing the region of the cervical sympathetic has a marked temporary influence over the retinal circulation. It may cause contraction of the arteries, or dilatation of the veins.

2. The faradic current produces precisely the same effects on the retinal circulation as the galvanic, only more slowly. The physiological difference between the current in this respect is therefore a difference of degree and not of kind.

3. Mild currents and short applications caused contraction of the blood-vessel of the retina, while strong currents and long applications caused dilatation. Much seemed to depend *on the temperament and condition* of the individual. *What would cause contraction in one would in the other cause dilatation.*² These varying effects correspond with clinical experience.

4. When the patient on whom the experiment is made is in an excited or irritable condition from any cause, or from previous electrization, even a mild current will sometimes cause dilatation at once, without any early contraction.

5. The contraction which takes place is sometimes followed, a few minutes after the close of the *séance*, by dilatation which is greater than normal.

6. The dilatation which takes place is sometimes followed by contraction after the close of the *séance*.

The question now arises, whether these changes in the retinal circulation were due to the effect of the current on the sympathetic or on the pneumogastric, or did they take place through the spinal cord or by reflex action.

This question is answered by comparing the result of these

¹ The ophthalmologists who observed the retina in these experiments were Drs. Roosa, Hackley, Loring, Matthewson, and Newton, to all of whom I desire to return my acknowledgments.

² The opposite and contradictory results obtained by different observers who have studied the effects of chloral, bromide of potassium, etc., on the retinal circulation, may be similarly explained.

experiments with the result of experiments made by Duchenne and Prof. Ligeois, of Paris. These gentlemen laid bare the cervical sympathetic in a rabbit and electrized it with both currents in the same manner that I electrized the necks of the individuals on whom I experimented. The results on the circulation in the rabbit's ear were in every distinctive feature identical with the results on the retina when the galvanic current was passed through the neck of the living human subject.

The effects of galvanizing the cervical sympathetic—disposition to sleep, sweating, increased circulation in the extremities, etc.—seem to confirm these physiological observations.

While making all these concessions, I retract nothing I have elsewhere said of the method of using electricity by galvanizing the cervical sympathetic. It is a method that has been greatly overrated, and the effects it produces are a complex resultant of the direct and indirect action of the arrest on other parts of the person's system besides the sympathetic. Practically I find that *central galvanization* accomplishes all that galvanization of the cervical sympathetic will accomplish, and *very much more than the latter method could accomplish*.

The experiments of Onimus and Legros¹—from which they conclude that the *faradic* current always *contracts*, and the *galvanic* always *dilates*, the blood-vessels—are unsatisfactory, for two reasons:

1. They ignore the wide difference in degree between man and the lower animals. In proportion as the organization of man is more complex than that of the lower animals, in that proportion will the physiological reactions of the human body to the electric current, or indeed to any other influence, be more complex and uncertain, and more liable to deviations and modifications, than the physiological reactions of the inferior forms of life to which we are supposed to be related. Conclusions in electro-physiology, derived solely from experiments on animals, have therefore the great merit of simplicity, but when applied to the far higher and more com-

¹ "Traité d'Electricité Médicale," Paris, 1872, pp. 177-185.

plex organization of man, and especially of civilized man, with his excessively-sensitive system of nerves, they are apt to lead into serious error. Granted that the differential effects of the galvanic and faradic currents on the sympathetic of animals are precisely what has been claimed by Onimus and Legros, it by no means follows that the same is true of the susceptible nervous system of human beings.

2. They do not attach sufficient importance to the strength of the current in making electro-physiological researches. A current from a powerful battery of say thirty cells may produce an effect to all appearance entirely opposite from that produced by a current from a weak battery of five or ten cells. This consideration is of very great importance in electro-therapeutics, and is probably not much less so in electro-physiology.

3. *Is it possible to improve the General Nutrition of Marasmic and Debilitated Children by General Faradization?*

This query can now be answered definitely in the affirmative. I am accustomed to apply the faradic current all over children and very young babies, in all cases where lack of appetite or strength, or flabbiness of muscle, or emaciation, or simple nervous irritability, indicates a chronically depraved nutrition of the general system.

I make these applications with currents as strong as can be borne without apparent pain for about two minutes. It is a fact of great interest that children bear electricity relatively very much better than adults. With many adults of both sexes electrization must be administered with caution and with studious care not to overdo the treatment; with children this caution appears to be less requisite. All other medicines are adapted to the age of the patient; to a babe of one year we give one-twelfth, to a child of seven years one-half of the adult's dose. Electricity does not need to be so adapted. Unpleasant effects of a temporary character may be caused by such undue stimulation, but the danger is, I believe, less than in the treatment of adults, at least when the faradic current is used.

I attempt no explanation of this fact. We know that the nervous system of children is different from the nervous system of maturity; that it is less liable to neuralgia, to hysteria, hypochondriasis, and insanity, and it may be that, between this fact of comparative exemption from the nervous condition of which these diseases are symptoms and the fact of the greater capacity for bearing electricity, there is a kind of correlation which future science will unfold.

I have sometimes suspected that perhaps children might, after all, experience equally with adults the annoying secondary effects of over-electrization; that, the *malaise*, the nervousness, the exaggeration of general morbid symptoms, are really experienced by children when they receive more electrical treatment than is good for them, but that their defective intelligence does not allow them to observe these unpleasant effects or to speak of them.

Certain it is that children, of both sexes, and of all ages between a few months and a few years, can be faradized; one pole armed with a broad sponge being applied to the coccyx, the other applied all over the surface of the trunk and limbs daily, or every other day, without any apparent harm, and with rapid, permanent and sometimes brilliant improvement in the nutrition.

More specifically, the infant thus treated exhibits greater liveliness and vigor, nurses with greater energy and enthusiasm, grows more rapidly, and assumes a healthier color. Infants do not object to the treatment; some of them appear to like it as they like milk.

Of a litter of four puppies, two were submitted to general faradization, every other day, for eight minutes each, and two were not so treated, all having an equal chance at their mother's breast and nothing besides. All the puppies were carefully weighed at the beginning and at the end of the treatment, which lasted for four weeks. It was found that both of the pups that had been electrized weighed more than the puppies that had not been electrized; all had, of course, increased in weight, but of those electrized one had increased *five* ounces and the other *eleven* ounces more than his fellows that had not been electrized. The difference of size in favor

of the puppies that were electrized was so marked and so easy to see, that without great difficulty one who had never seen them succeeded in picking out, from ocular inspection, those that had been treated, and that too in the evening, and in a bad gas-light. It was observed during the treatment that the puppies that were electrized became ravenous, and sucked with greater energy than their less favored companions.¹ That this result is exceedingly interesting and suggestive, all will agree, and yet it is nothing more than I have frequently obtained in the treatment of patients, even of adults. I have frequently treated babies from six weeks old and upward, in the same manner as these pups were treated, and for the same purpose.

The method of treating the pups, I may remark, was to put them on a sheet of copper, while the hand of the operator or a sponge-electrode was rubbed all over the surface of the body, previously moistened.

I am now making a similar experiment with a litter of rabbits.

4. *Are there certain Constitutions for which Electricity in any Form, or however administered, is contraindicated?*

This question must also be answered in the affirmative. There are individuals whom electricity always injures, the only difference in the effect on them between a mild and a severe application being, that the former injures less than the latter. There are patients upon whom all electro-therapeutical skill and experience are wasted; their temperaments are not *en rapport* with this mysterious force which we call electricity.

It matters not what may be the special disease or symptoms of disease from which they suffer—paralysis, or neuralgia, or neurasthenia, or hysteria, or affections of special organs—the immediate and the permanent effects of galvanization or faradization, general or localized, are evil and only evil. I have not arrived at this opinion by theorizing; I have been driven to it by the accumulating and irresistible logic of facts. The first query that arises in the mind of the electro-thera-

¹ The details of the application were entrusted to my assistant, Dr. Sterling.

peutist when a case under his care responds badly is, "Am I rightly using this remedy; am I making the application too long or too severe, or by improper methods? Would a change of current be desirable?" But after we have tried all electrical applications; after we have gone from galvanism to faradism, from general to localized electrization, from long and severe to short and gentle treatment; after we have rung the changes on all these, and yet persistently aggravate rather than mollify the disease, and instead of strength and relief produce weakness and distress, and instead of calmness cause irritation—then we have only to make as graceful a retreat as possible, and put that patient down as a case that was not born to be treated by electricity. I have no explanation to offer of this phenomenon; and the popular belief or supposition, that the excess or deficiency of animal electricity has something to do with these matters, is as undemonstrable as it is plausible; he who should attempt to prove or disprove it would find he had undertaken any thing but an easy task. It would seem to come in the list of those strange but familiar likes and dislikes in regard to certain articles of food or drink, or to certain sights or odors. I know of no physiognomical or other external appearances by which to determine whether a patient does or does not belong to the unfortunate few who can have no lot or share in electro-therapeutics. The strongest equally with the weakest, the plethoric and the enervated, are found among these Gentiles of science.

The reverse proposition, that there are certain constitutions for which, by whatever form of chronic disease they may be afflicted, electricity is always indicated, is equally true. There are patients who find in electrical treatment almost a specific. Whether they suffer from dyspepsia or neurasthenia, from hysteria or diseases of special organs, rheumatism or neuralgia, electrization always relieves them up to a certain point, at least, if it does not positively cure. *The broad fact to be understood is, that it is not so much the disease or the symptoms as the temperament that indicates or contraindicates electrization.*

While some chronic diseases are more amenable to electricity than others, among all patients there are individuals to

whom it is a matter of indifference what special affection they may suffer from ; so long as improvement in local or general nutrition is indicated, they will be benefited by electrical treatment.

To all this it should be added that some persons are *indifferent* to electricity—they can bear almost any strength of either current very frequently, and for long applications, without experiencing any effect either good or evil. Electricity may be poured over them in limitless measure ; they may be saturated with it, and they may come out from the applications, or from a long course of treatment, just as they were before, not a whit better or worse. Patients who are quite delicate and sensitive exhibit this supreme and provoking indifference to electricity. I am inclined to believe also that patients vary in *their susceptibility to electricity at different times of life*. Susceptibility to stimulants and narcotics oftentimes undergoes strange modifications during the lifetime of an individual. Those who at one time cannot drink coffee sometimes find that a few years so modify the temperament that they can drink it with absolute freedom, and *vice versa*. Similarly, also, alcoholic liquors act in a most capricious way, sometimes benefiting, at other times injuring even when nearly all the other conditions except age are the same. Idiosyncrasies in regard to certain articles of food are by no means constant through life—they may change either way, and that too in the course of a few years ; they may be modified by attached febrile or other diseases that revolutionize the system, or by residence in various climates, or by mere lapse of years. Analogy would lead us to suppose that susceptibility to electricity might also be thus modified, and my observations seem to convince me that such is the case.

I am further inclined to believe that susceptibility to electricity, favorable and unfavorable, like all other constitutional tendencies, is subject to the laws of hereditary descent, and runs in families. I am now treating by electricity three members of the family of a physician, who are afflicted with quite diverse maladies, but all of whom not only improve under the treatment, but can be electrified with great freedom by either current ; and yet none of them are strong, and two of them are delicate.

On the other hand, I have treated families where several of the members are so susceptible to the electric current that the application must be made with great care lest unpleasant results occur. I am fully convinced also that the proportion of those who do *not* bear electricity well is larger among the higher than among the lower classes; in hospital and dispensary practice the number of patients who exhibit excessive susceptibility to the electric treatment is quite limited, whereas in private practice, among the intellectual classes, one out of five or ten, take the cases as they run, must be treated with very considerable caution, lest disagreeable symptoms arise.

5. Have the Slow Interruptions of the Faradic Current any Therapeutical Advantage over the Rapid Interruptions of the same Current, or over the Slow Interruptions of the Galvanic Current?

In this matter there has been too little of fresh, independent observation, and too much of blind and absurd deference to European authority. If a muscle will not contract under a rapidly-interrupting faradic or slowly-interrupting galvanic current, it will not contract under a faradic current, however slowly interrupted. The slow interruptions are not, according to my experience, any less irritating than the rapid interruptions. I have tested them side by side with rapid interruptions, in cases of facial paralysis, hemiplegia, and infantile paralysis, for the sole purpose of ascertaining the truth in this matter, and I do not find any therapeutic advantage in favor of the slow interruptions. It may be that in Duchenne's machine such a difference of therapeutic action is observable; but those who use a machine which, like Kidder's, gives a very rapidly-interrupted and pleasant current, will find that the reputed advantages of a slow interruption have been overrated. I have compared slow with rapid interruptions in the machine of the Galvano-Faradic Manufacturing Company, which is an excellent contrivance for producing slow interruptions, and I have not been able to differentiate any advantage that it has over the galvanic current, or over the rapid interruption of the same machine.

The practical difference between the *primary* and *second-*

ary faradic currents has also been over-estimated. Granting all that Duchenne claims in regard to the differential *physiological* action of the currents of the primary and secondary coil, that the primary acts more powerfully on the deeper tissues, and the secondary on the skin, and so forth, still we are forced to admit that the practical therapeutic difference in the action of the currents is not so demonstrable, and that, whatever difference there may be, cannot well be reduced to a general law.

Electro-physiology is one science, electro-therapeutics is another. Electro-physiology answers only to explain, to fortify, and to elucidate, and in some respects to guide electro-therapeutics; but, in the present state of either science, it cannot be a complete basis for electro-therapeutics, and theoretical deductions from the former to the latter cannot be accepted until they have stood the test of experience.

Similarly, also, in Kidder's machine, in which the helix is composed of three coils of wire of different length and thickness connected together, and, so to speak, *tapped*, at different points there is a decided difference in the electro-physiological action of the different currents A-B, A-C, A-D, B-C, C-D, and B-S; but the practical difference between these currents in the treatment of disease, so far as Dr. Rockwell and myself can ascertain from long use of the machine, can mostly be explained by the differences of intensity. To the head and very sensitive parts we use the A-B current, because it is mild and pleasant; to the body generally, we use A-D and A-C.

There may be an important therapeutical difference in the action of these currents besides that of simple intensity, but, on account of the vast complications of the subject, it seems impossible to reduce it to a general law.

ART. V.—*Experiments on the Tonicity of the Arterioles.* By JOHN J. MASON, M. D., Attending Physician at the New York State Hospital for Diseases of the Nervous System, and at the Out-door Department of Bellevue Hospital.

IN an article¹ published last April in this JOURNAL, I endeavored to present as clearly as possible a new theory in regard to the rapid formation of congested patches in the region supplied by an artery occluded by an embolus.

The hypothesis upon which the theory rested was there admitted to be lacking in experimental proof, and arguments from analogy were solely employed.

Soon after the appearance of the April number of the JOURNAL, I received a copy of Prof. Cohnheim's work² on the "Pathology of Embolism," and have since repeated the greater part of his experiments.

This was undertaken not with the expectation of improving upon any of the methods employed, or of changing any of the facts demonstrated by the distinguished German pathologist.

In the article³ above referred to, the opinion was expressed that changes in the function of the muscular walls of the arteries, if due to want of nutrition, ought to belong among the phenomena of the later stages of embolism, and not among those of its earlier stages; and it was for more light on this point that I reviewed with great care that portion of Cohnheim's observations in which he treats of the dependence of the vascular walls for their integrity upon the circulation.

Here the base of the tongue of a frog, rendered passive by woorara, was ligated, over a piece of soft leather, in order to protect the parts from laceration and permit one to remove the thread at will. When the ligature was allowed to remain around the tongue for several hours and then sev-

¹ "On the Pathogeny of the Infarctions, or Congested Patches which follow Embolism" (PSYCHOLOGICAL JOURNAL for April, 1872).

² "Untersuchungen über die Embolische Processe," Berlin, 1872. See also Review of the same, by Dr. H. D. Nicoll, of this city (NEW YORK MEDICAL JOURNAL for July, 1872).

³ See note on page 277 of the April number of this JOURNAL.

ered, the blood flowed in with great rapidity, and the vessels were dilated to a very marked degree.

The arteries then began to contract upon the incoming current, and *later* the veins regained their normal calibre. What we already know of the physiology of the vaso-motor nerves would seem to explain all this; but Cohnheim sees here only the effect caused by the withdrawal of blood, by which the walls of the vessels suffer rapidly in their nutrition, and even lose their functional capacity.

Even in those cases in which this deprivation has continued for forty-eight hours, the strongest microscopic objectives fail to discover the faintest trace of alteration in the muscular walls themselves—a fact which he emphasizes, as going to show the probability that the same loss of tone may occur, from the same cause, a very short time after ligature.

Now, in order to study the effect of time upon the degree of dilatation in an artery, I have often removed the thread one minute after tightening it, and always with the same result as when it was allowed to remain on for several hours, except that the arteries in the former case closed more rapidly upon the blood than in the latter.

When a single artery in the tongue was ligated over a bit of wire, and the thread cut after one minute, the arterial branches beyond the ligature were distended to a size double that of the corresponding veins. When, now, in the same frog, the base of the organ was ligated over a piece of leather as before, the artery on the other side was not dilated *by the blood* as widely as its mate, which had been tied before, and closed upon the current sooner than the latter vessel. The thread was always cut in both cases one minute after tying.

The explanation of what we have observed in these cases is so simple that it need hardly be stated. A more complete paralysis resulted from the direct ligature than from that made over leather and the underlying soft parts, and hence the slowness with which the tone of the muscular fibres was restored in the branches of the artery ligated singly.

Nervous influence must be concerned in the production of these phenomena, and the time between tying and cutting the

thread was so short that nutritive change must be excluded from having any share in their causation.

Besides the direct nervous influence, the existence of which cannot be denied, is there no other which we can regard as playing an important part here?

Does this impulse, synchronous with the heart's systole, which is so plainly visible even through an objective of low power, exert no influence? Analogy strongly negatives this supposition, and the following experiments, which have been *often repeated*, go to prove that the rhythmical entrance of blood, by exerting a sudden distensile force upon the arterial coats, helps to maintain their tonicity.

It occurred to me, while studying the experiments of Cohnheim, that if this sudden distensile impulse had no stimulating effect upon the vasal muscular fibres, these arteries ought to become dilated, soon after the tension within them shall have been increased.

Two ways of increasing this tension suggested themselves: one by ligating the artery of one side of the tongue, thereby augmenting the tension in that of the other; and the second by ligating all the veins, and shutting off the outlet from the arteries. That increase of the expansive force results from both these methods, is a physical necessity.

On making the first experiment, I could discover no dilatation, after fifteen minutes, in the branches of the open artery. When all the veins were tied in the same tongue, the calibre of the open artery continued normal as before. There was no perceptible widening of the arterial branches—none at least that a micrometer (each line of which denoted $\frac{1}{1000}$ of an inch with the objective used) could detect. Then came the usual slowing of the circulation, first in the veins, and then in the arteries, until a point was reached where no real progress of a blood-globule could be made out in the latter vessels. Nothing remained but the *va-et-vient* movement of the blood to act upon these delicate vascular walls—nothing, at least, so far as the blood was concerned, for the process of nutrition had ceased.

There was no widening of the arteries for some time after nutrition had ceased, although the *vis a tergo* remained the same, and the tension was augmented.

The same results were observed when the veins alone were ligated, leaving both arteries open.

If, now, we ligated the entire base of the tongue, and cut the thread after one minute, as before, the arteries became largely distended.

In the experiment of tying the veins, no injury was done to the nerves of that artery the branches of which were under the field of the microscope.

This method of studying microscopically arterial tension in its relation to arterial tonicity has not been employed before, to my knowledge. We can now regard the resistance which the muscular coats of the arterioles offer to the distensile force of the current of blood as commensurate, to a certain extent, with the distensile force itself, provided the latter be suddenly exerted. Viewed in this light, the arterioles are true regulators of nutrition, subject from time to time to perturbing influences through their sympathetic or cerebro-spinal nerve-fibres.

Nothing is simpler than the repetition of these experiments, care being taken, for obvious reasons, to select vigorous frogs, freshly caught, and to administer the woorara in small doses. Of course, the rapidity of the circulating fluid is magnified as well as are the elements themselves, and this consideration seems, at first sight, to constitute a source of error. It is equally true, however, that the time between the impulses seen in the blood-current remains the same; and also that, however much the motion of the blood-globules may be magnified in regard to its rapidity, the ratio between the latter and the size of the elements is a constant one.

If these experiments are demonstrative of the truth of my proposition, this cause of arterial tonicity cannot be omitted in studying the pathogeny of the infarctions, although the congestion does not become entirely developed immediately after the occlusion of an artery. It claims no prominent place, however, in the pathology of embolism, and may add but little to the researches of Cohnheim toward removing the obscurity which has heretofore surrounded this interesting subject.

Rather, in the hope that it may be regarded as a new

datum acquired for physiological science, and be applied to explain obscure phenomena belonging to the physiology of the vaso-motor nervous system, has the writer ventured to submit the subject a second time to the consideration of those interested in the solution of these important problems.

CONTEMPORARY LITERATURE.

REVIEWS.

Mitchell on Injuries of the Nerves.

THIS admirable monograph¹ is one of the many important results of the liberal and enlightened policy pursued by the authorities upon whom devolved the medical and surgical direction of our army during the late civil war—a policy which has shed lustre on American science, medical and surgical, placing it, by carefully-conducted and admirably-recorded original observation, at least on a level with that of any other country. During the four years of this great struggle every thing moved with marvellous rapidity. Men lived fast, as well as died fast, and the results to science are only just now beginning to manifest themselves. The circulars which have as yet issued from the War Department are only, we believe, a slight indication of the vast material which awaits development in its archives, and when time shall bring about this development it will be found that, in this rapid stride, science and life went hand in hand, and, by reversing the irony of the poet of all times, we may say truly, “The *good* which men do lives after them, the *evil* is often interred with their bones;” so may it be in our history, and we have faith to believe it will be.

Early in the history of the war, Dr. Hammond, then surgeon-general, established separate wards or hospitals for special diseases, appointing officers with special qualifications for the duties assigned them, and afforded them every facility to pursue their investigations. Hospitals were established for diseases of the eye, for stumps, for syphilis, for diseases of the heart and lungs, and there were matured plans for the further development of this system which have resulted in most important advantages to medical and surgical science. Among the hospitals established was one for diseases and injuries of nerves, and Dr.

¹ “Injuries of Nerves, and their Consequences.” By S. Weir Mitchell, M. D. Philadelphia: J. B. Lippincott & Co., 1872.

S. Weir Mitchell was placed in charge, having, we may reasonably suppose, shown some special qualification for the task imposed upon him. However this may be, the book before us shows us the wisdom of the choice, and is a valuable contribution to science, and we welcome it and take pride in it as an American contribution thereto.

The hospital of which our author had the charge consisted of four hundred beds, and it presented probably the best opportunity, for the study of nervous lesions and the diseases incident thereto, that has ever been afforded in this or any other country. A multitude of cases, presenting almost every conceivable type of obscure nervous disease, were sent to this hospital for treatment and observation. Examples of lesion of almost every great nerve of the body were presented, and these too of the most rare kind. New modes of treatment were devised, and hypodermic medication, gymnastic exercise, and electricity, were severally called into use, as they seemed to be indicated by the nature of the case, and the effects of each remedy carefully noted.

The responsibility involved in the possession of such rare opportunities appears to have been well and thoroughly met, and the way the duties to the profession of medicine were discharged is fully apparent in the pages of the volume before us. Careful notes were taken of every case, and continued all the time the patient was under observation, while, says the author, in many instances the utmost care was taken to collect, in the interval which has elapsed since the war, such details of later history as were needed to clear up or complete the story of symptoms or prognosis.

Chapter II. of the monograph is devoted to the anatomy of nerves, and is singularly clear and concise. Each system, spinal, motor, sensory, encephalic, organic, etc., receives due attention, as was to have been expected in laying the foundation of such a treatise.

In Chapter III. neuro-physiology is taken up and clearly set forth; and in Chapter IV. the author treats of the pathology of nerve-lesions.

We need not dwell on this part of the book, but reserve all our space for the interesting practical observations and well-reported original cases brought forward in subsequent chapters. We cannot pass these chapters by, however, without remarking that the author appears to have condensed into them almost every thing of practical importance in respect to the subject treated, and brought all the knowledge we have down to the present time. We will not forego the subjoined extracts, however, from the chapter on neuro-physiology, touching the influence of neural irritation and palsies:

“The mechanism by which neural irritations or palsies give rise to

inflammations, eruptions, and the like, is made more clear by the attendant facts in regard to the secretions of the skin. These, as I shall show, are sometimes lessened or annihilated, sometimes increased, and more often altered so as to become excessively acid and offensive. It is quite conceivable that the products of disintegration in the deeper tissues are similarly affected, so as to be sometimes either excessive or deficient, and sometimes abnormal in character. Meantime the irregular and retarded circulation fails to remove these products with even the normal rapidity, and then accumulation may come to act as a local poison to limited regions of tissue, and to be efficient in bringing about the diseased conditions of which I have spoken."

"Partial wounds of nerves and especially gunshot-lesions are apt to give rise to a large number of trophic changes in the skin, hair, nails, areolar tissue and muscles. Except the entire arrest, for a time, of nail-growth, every trophic alteration capable of arising from injuries or diseases of the centres is also to be met with as a consequence of wounds of nerves" (page 38).

Speaking of neural stimulants (on page 50), the author makes the following remarks, which will be of great interest to those medical practitioners who charge upon the liver and bile so many of the ills to which flesh is heir, without perhaps reflecting that these "liver-derangements" and "vitiated bile secretions" are themselves the result of disturbed nerve-force in many instances.

"The most interesting of the substances thus capable of exciting the nerves are undoubtedly the biliary acids, for it is to these, as Budge and Kühne have proved, that we must assign the capability of the bile itself to evoke neuro-muscular spasms, a quality upon which some very extraordinary hypotheses have been founded."

In all probability many of these agents act by subtracting from the nerve its water, and thus finally abolishing, for a time, one of the conditions of its active physiological life; for, as has been repeatedly shown, the functions of the nerve may be restored by carefully allowing it to reabsorb a supply of this essential element.

Chapter IV., under the head of "congestion of nerves," neuritis, treats of the physiological pathology of nerve-lesions, and of acute neuritis, with the symptoms, treatment, terminations, etc., in these various conditions.

The author states his belief that many of the so-called functional disturbances of an obscure character, as regards causation, are dependent on congestion, but that few pathologists would perhaps be able to define clearly the symptoms that indicate this condition, or

to point out the precise pathological state which may disappear with death.

The following remarks bear, in an interesting manner, on those forms of neuralgia caused by exposure to cold :

"When by any method we freeze or even chill the living tissues, the act of thawing is followed by more or less congestion. The nervous tissues are no exception to this law, and whether in brain, spine, or nerve-track, congestion is sure to follow the return to warmth, and to occasion symptoms which vary with the neural region attacked. . . . By means, therefore, of chilling and thawing a nerve, I have been able, as I believe, to produce congestion with great certainty, and thus to study in man its associated symptoms; and arrive at the pathological traces which it leaves upon the nervous tissues."

As we read these remarks of Dr. Mitchell, the recollection of a sad but interesting illustrative case was brought to the mind of the writer—that of a young lady who, immediately after her return home from a somewhat prolonged sleigh-ride, during which she had faced, with an unusually insufficient head-dressing, one of those piercing winds of a Canadian winter, was seized with violent headache and delirium, followed by fatal stupor, the result undoubtedly of the exposure, and the consequent congestion attendant on the reaction which has been so well pointed out by Dr. Mitchell in the paragraph quoted above.

The author, on page 61, speaks of acute idiopathic neuritis as a rare disease. Arising from injuries to nerves, and sometimes from cancerous inroads, it is more common.

The writer, in the course of twenty-five years, recollects but one distinctly-marked case of this painful and sometimes very prolonged disease. This was of the nerves of the left arm, and arose in a highly-excitabile and nervous lady from great fatigue of the arm and exposure to cold, while holding the rein of a bridle in managing a restless and hard-bitted horse, during a long ride in the saddle. There were in this case many of the symptoms described by Dr. Mitchell on page 62. The fever came on in exacerbations, and more particularly on alternate days. The pain was excruciating, and affected the whole limb, extending to the axilla and shoulder; the pain was greatly aggravated by the slightest motion of the limb, and by change, especially when it was put in a dependent position, however slight. The course of the nerves could be distinctly traced by a pale-red band, and the sensibility along these lines was exceedingly acute, though the whole limb was hyperæsthetic. The symptoms gradually disappeared

after giving rise for several weeks to the most excruciating torture, but it was some time before the limb was restored to its full vigor.

The cases which follow are so interesting that we give them entire. There is also a psychological character attached to them, as the influence of severe and prolonged physical agony on the mental faculties, the disposition, and memory, is glanced at:

"J. C., sergeant, consulted me on account of loss of power in the arm, with severe neuralgia. At Gettysburg he received a ball-wound in the left neck, splintering the clavicle and emerging through the trapezius. Some fragments of bone were lifted out of the wound, which did well until a week later, when, on the way to Washington, he was suddenly taken with a chill of some severity, followed by high fever. At the same time the whole arm began to ache, darting pains shot up and down it, and the skin on the inside of the arm, below the axilla, was seen to be red. The nerve-tracks were extremely tender. On the third day the whole arm was somewhat swollen, and the darting and aching pain was only subdued by frequent hypodermic injections. His first notable relief was obtained by an application of cut cups to the neck and shoulder, and gradually the pain lessened to its present grade of severity. The ulnar and median were hard, enormously enlarged, and very tender. J. C. described himself as having been made delirious by the earlier pain of his disease; and, even when seen by me after it had abated, he showed very plainly that the mind as well as the body had suffered, his memory being impaired, and his temper excessively irritable. This was a very good example of acute traumatic neuritis passing into the chronic form.

"L. P., a sergeant, was shot through the middle third of the thigh, in the battle of Fredericksburg, and reached our ward within seven days. Whether the ball wounded the sciatic nerve or not was uncertain, but it must at least have bruised it, since there was some loss of power and of feeling.

"A small abscess in the walls of the wound of exit discharged itself with a fragment of clothing, on the morning of the eighth day, and that evening he had a slight chill, followed by fever and occasional rigors, lasting all night! There was sharp pain in the wound, and, before next morning, agonizing aching down the sciatic distribution, with intense burning in the foot. All next day the man was delirious, his face flushed, his pulse 130 and upward, his tongue red and dry. He begged at times to be killed, at others to go home; while sometimes he would lie open-eyed, regarding ferociously the passers-by who shook his bed as they walked, every movement seeming to add to his

torment. On the third day the fever abated and his pulse fell. He said the pain was no better; but by this time he was quite unmanned, and his evidence was valueless. He would at times, however, allow me to handle the limb, which he had until then refused to do. It was slightly swollen, bathed in profuse sweat, as it had been throughout the attack, and the nerve-track was exquisitely tender; when, indeed, an assistant rudely pressed upon it he shrieked with pain, and grew faint, pallid, and sick at the stomach. I could detect no band of redness over the nerve, but at two places, between the wound and the foot, there were very red spots. One of these was in the popliteal space, and one over the point where the peroneal nerve dips into the muscles."

Under active treatment the pain lessened, but the foot became subject to severe burning, and it was many months before the patient recovered from the shock of this painful malady. From being a man of gay and kindly temper, known in his company as a good-natured jester, he became morose and melancholy, and complained that reading gave him vertigo, and that his memory of recent events was bad.

Touching the prognosis, the author regards this as dark, and graver in proportion to the length of nerve involved, and the length it has travelled in a central direction—the symptoms are sometimes to be relieved, but rarely altogether removed.

The primary pathological results of inflammation of nerve are increased vascularity, and enlargement of the nerve-vessels—an enormous development of its connective-tissue elements, and effusion of serum within the nerve-sheath and between the nerve-fibres. When resolution occurs, the products of inflammation are slowly reabsorbed, and a general return of function takes place. "Higher grades of neuritis reduce a nerve rapidly to a gray or yellowish-red pulpy cord, for which the inflammation and the constricting sheath are together responsible. The nerve is then tender and readily torn, and its tissue infiltrated with bloody pus, the color of the nerve becoming yellow, or brownish-red, or chocolate-tinted, when abscesses may form around the track." Ulceration is described as the final stage of this destructive process.

Of the treatment of congested or inflamed nerves, the author says that his experience, like that of most physicians, is limited, he having had but one case of acute neuritis under his entire control from the start. In this case great advantage was derived from enveloping the arm in ice-bags, which lessened the pain apparently. Attention was also given to position, the limb being elevated above

the body. Hypodermic injections of $\frac{1}{8}$ gr. of sulph. of atropia and $\frac{1}{2}$ gr. of sulph. of morphia were employed with advantage every four hours or oftener. Leeches were also used with good effect (in the case treated by the writer, leeches along or near the track of the inflamed nerve seemed of great benefit). Attention was also paid to the secretions and general physical condition. The presence of such torture as is incident to this affliction has a tendency to lower vital tone, and this should be met with appropriate tonics. Wherever scurvy or malarial disease seemed a concomitant, as is frequently the case in the army, this is to be met by appropriate remedies.

In chronic neuritis, the author insists on absolute and prolonged rest of the limb, without which little good can be accomplished. If it is the leg that is affected, the patient must be placed in bed, and consent to wear a splint for a number of weeks. If the arm is affected, a splint insures that repose without which all remedies are useless. The remedy the author seems to place the most reliance on is the application of cold by means of Chapman's ice-bags. The relief is sometimes, as was to be supposed, very marked, and the size of the nerve, its hardness and tenderness, are much diminished. The ice-bags are used over the whole length of the main nerve. While recommending the free use of sedatives, the author cautions us against these reckless employments, as likely to bring about neural and physical conditions fatal to successful treatment.

Chapter V. treats of the varieties of mechanical injuries to nerves, and our readers can judge something of the real interest of this chapter, when we bring forward the headings of the paragraphs under which he ranges his varieties, and rare and instructive illustrative cases:

DIRECT LESION BY A MISSILE OF WAR, OR BY INCISION.

In the United States Army Hospital for Nervous Diseases was treated every conceivable variety of nerve-lesion, from the slightest abrasion to the absolute loss of a considerable proportion of the nerve-substance. Gunshot-wounds, of course, were the most frequent.

As regards the *seat of wounds*, a large proportion was in the upper half of the body, as was the case with all wounds. Lesions of the cranial nerves, however, were rare, owing to the fatal results from face or brain complications. One wound of the sympathetic, the only one on record, one of the fifth, and several of the seventh, are reported.

The *extent and amount* of injury to the nerve are learned by a careful examination of the parts to which the nerve is finally distributed,

what movements are lost, and what skin-surface shows loss of sensibility. Here the author reports in illustration two very interesting cases: one a *section of the median nerve, with loss of sensation and motion, and abscess at the site of the wound*; another of *division of the ulnar nerve and vessels, and of the median nerve; anæsthesia of the parts supplied; inflammation of the tips of the fingers, unattended by sensation, diminution of animal heat in all the parts paralyzed; increase of heat during inflammation, but still not up to the normal standard.*

The author relates a case of *lancet-wound* of a nerve from a bungling attempt at venesection by a gardener, followed by convulsions and great pain. The pain and convulsions were at once relieved by a deep incision at some distance above the injury. It is somewhat surprising that no more accidents of this kind result from the indiscriminate use of the hypodermic syringe by persons who resort to this method of bringing themselves under the happy influence of morphia, a practice far more common, we believe, than is generally known. In one case, which came under the writer's observation, the whole surface of the upper and lower limbs and abdomen was mottled by the punctures of the hypodermic-needle. The operation had been performed by the patient herself daily, and sometimes oftener, for many months. This morphia-injector showed all the characteristics of the confirmed opium-eater, and breaking up the habit, under the restraints of a hospital, was followed by all that tremor of nervous agitations which follows the deprivation of opium to the confirmed opium-eater.

The author proceeds to speak of *contusion of nerves*, and the attendant results and symptoms. One of the most frequent of these results is the atrophic alteration of the muscles. This injury the author illustrates by cases that have come under his own observation. One case of contusion of the right brachial plexus, with pain, loss of motion in the deltoid muscle, and wasting, was relieved by electricity; rheumatism occurred a year later, with renewed neuralgia and weakness, and final relief. Then follow remarks on the injury of nerves from dislocations, and their reduction, also accompanied by illustrative cases. The injury to nerves from fractured bones is glanced at and illustrated, and injury to nerves from compression, and various forms of pressure—pressure from inflammation, from cicatrices, callus, tumors, and the compression of nerves during delivery—pressure from fecal accumulations, from spasm, and paralysis from local pressure on nerves owing to malposition during sleep; and lastly, pressure from the crutch, giving rise to what has been termed the crutch-palsy. When

we say that all these conditions are fully and clearly elucidated by interesting cases and original observations, our readers can form some estimate of the character of this chapter of Dr. Mitchell's book.

Chapter VI. treats of the symptomatology of nerve-lesions.

The author states that, if we had presented to us a hand which was suffering from wound of the median nerve, there would be nothing in the symptoms to show how it had been caused, and the hurt might have been due to gunshot-wound, to incision, to a puncture, or to a simple contusion of the nerve.

"I have questioned," says the author, "hundreds of men who have been shot through nerve-trunks and who have found a curious diversity as to their first sensations. Usually the man thinks he is struck with a stick or a stone, and angrily accuses a comrade of the trick. Others suffer instant and intense pain, which is felt at the wound and down the nerve-tracks. One described the sensation as that experienced when a cricket-bat carelessly held is struck by a swift ball." Frequently, when the primary pain is severe, it is lost in a few moments; indeed, continuous pain, he says, is rare. Some have remote pain, and none at the point hurt. In one case, where the sciatic nerve was divided, the pain was altogether in the testicle, which was retracted during several hours.

Some neck-wounds cause for the moment the most horrible pain at the insertion of the deltoid muscle. This, the author thinks, may be due to spasm of the muscle, but the reason of the pain at this point is not altogether clear. One, shot in the right side of the neck, had pain in both arms. An officer struck by a ball in the right thigh felt pain only in the left limb, and throughout suffered more in that part.

Not the least interesting portion of the chapter on symptomatology, especially to the psychologist, is that which touches on the mental faculties, and their disturbances by nerve-lesions and constitutional shock. This condition of shock is commonly described as one in which the patient becomes cold, faint, and trembling, with a small, fluttering pulse, with great mental depression and disquietude, with incoherence of speech, and confusion of thought. In twelve cases of wound of the brachial plexus in the neck, two fell senseless, seven fell with more or less confusion of mind, and three walked away. Sometimes, in place of a general impression on vaso-motor and cardio-motor centres, the shock was seen to be limited to a disturbance of ideational or emotional centres.

In a case of gunshot-wound of the right wrist-joint, injuring the ulnar and median nerves, much cerebral excitement was caused. The

patient, a colonel, ran along the line of his regiment "half crazed," in a state of wild excitement, and presently fell insensible, but not from loss of blood.

An officer wounded in the heel was thrown instantly into a condition of the utmost trepidation, and behaved like an insane person. His character for courage was undoubted, and a court of inquiry, for which he asked, cleared him on the surgical evidence.

A private, shot through the brachial plexus, became wildly excited, crying "Murder!" repeatedly, and accusing those near him in the ranks of having shot him. He did not fall.

An officer, shot through the right median nerve, was helped away to the rear, talking somewhat incoherently about matters foreign to the time and scene. He was very feeble, but lost little blood, and had not the least remembrance of having been shot, or of any event which followed within an hour afterward. Such cases as these are good examples of shock affecting variously the emotional or intellectual faculties. Legouest, in his "Surgery of the Crimean War," page 219, describes them as not uncommon.

Chapter VII. is devoted to the remote symptoms of nerve-lesions, and first among these are tetanus and chorea. The tendency toward irritation resulting in spasm increases, according to the observations of the author, as the nerves divide and approach the skin. In two hundred cases of wounds of the great nerves which came under the observation of the author during the war, not a single case of lock-jaw was seen. He also says that he has seen no example of chorea from wounds of large nerve-trunks, but has several times been called upon to treat the malady in the stumps left by amputations of the arm. In consulting the local symptoms which follow nerve-wounds and endow them with so much interest, the author treats first of nutritive changes; second, of altered states of sensibility; and, lastly, of the various causes which affect motility and mobility. Space will scarcely permit of our giving much more than the headings under which this branch of the subject is treated, but these we bring forward as an indication of what our readers may find in the book itself, which we cordially commend to them: Trophic changes, influence of nerve-injuries upon the nutrition of the skin and its appendages, cutaneous eruptions, atrophic conditions of the skin, glossy skin, eczema, alterations of the cutaneous appendages, the nails, hair, etc., nutritive changes in connective tissues, alterations of joints, influence of nerve-wounds on secretion, and on calorification.

Chapter VIII. treats of the sensory lesions incident to wounds of

nerves. Sensations may be either lessened, exalted, or perverted, so that we have as results hyperæsthesia, anæsthesia, and all the varieties of pain, with numberless sensations which vary so greatly in different cases that description is out of the question. Hyperæsthesia, or heightened sensibility, is one of the most common lesions of sensation. All cases of glossy skin with causalgia were sure, says the author, to exhibit hyperæsthesia of the affected surfaces or of regions near them. The hyperæsthesia is due, the author thinks, to nutritive conditions affecting the skin-surfaces and the nerves beneath them, so as to make the latter over-sensitive.

Muscular hyperæsthesia is also a common condition in gunshot-wounds of nerves, and in blows on the back injuring the outgoing nerves. In spinal concussion this was often the sole symptom, and sometimes limited to certain muscles. The muscle is frequently sensitive when the skin above it is not.

Defect of sensation, anæsthesia, may exist in any degree after wounds of nerves, from the slightest loss of sensibility to the most entire absence of that sense.

With the loss of pain and touch there is also lost the sense of temperature, and usually in like degree. The author states that he has never seen this loss from wounds of nerves without also the loss of the pain- and tact-sense. Neither has he seen any cases of wound of a nerve involving only loss of muscular sense.

As bearing upon the existence of separate nerves of touch and pain, the author brings forward two very interesting illustrative cases. In one of these, owing to a wound of the arm, there was a greatly-lessened sense of pain, with no loss of touch. The patient discriminated the compass-points as well in the hand of the wounded side as the other; while, when blindfolded, a large needle could be run nearly through the palm without his seeming to feel more than a slight pricking. This case the author thinks not quite free from suspicion of central disease, the result of the wound.

In the other case there was no doubt as to the purely peripheral nature of the changes which resulted in very remarkable analgesia, with preservation of the tactile and localizing sensation, and that of temperature. So complete was the loss of pain-sense that the electric wire-brush was felt but slightly, while it was interesting to note that there was hyperæsthesia of the deeper tissues. There was total loss of motion below the knee.

Pain is perhaps the most constant sequence of nerve-injuries; it exhibits the utmost variety as to the time of its coming and the char-

acter of its torment. Nerve-injuries may also cause pain, which, owing to inexplicable reflex transfers in the centres, may be felt in remote tissues outside of the region which is tributary to the wounded nerve.

The following remarks of the author, on page 195, are not only new to us in some respects, but curious and interesting, showing that the laws which govern all periodicity in disease are as yet very imperfectly, if at all, understood :

"The neuralgias common to all nerve-injuries, and which I desire clearly to distinguish from causalgia, with which, I should add, they may coexist, are apt to affect a quotidian type, and to occupy, as a rule, the latter rather than the earlier hours of the day. It is curious, and as yet unnoticed, that the pain of non-malarial neuralgia and of neuritis and neural sclerosis never assumes a tertian or any other than a quotidian type. It is quite rare for a patient to arouse from sleep with pain, and I have heard men remark that it took some time to get awake to the pain. This is familiarly illustrated where the toothache of the last night does not come on next day until exercise has stimulated the circulation. The tendency to intermit or remit in ordinary neuralgias frequently causes them to be ascribed to malaria; but the same tendency is seen in traumatic cases, or in the pains caused by pressure on nerves, as from aneurism, but is much more rare in those which I class as causalgia, and in which the pain usually appears at the time the man awakens, and pursues him with increasing torture throughout the day.

Chapter IX., on "diagnosis and prognosis of injuries of nerves," contains a report of a cure of wound of the neck and jaw, with curious results which are merely glanced at in this connection. There were loss of speech and deglutition, secondary hæmorrhage, for which ligation of the right primitive carotid artery was attempted, followed by palsy of the right arm, anæsthesia of the right side of the jaw and face, loss of gustation in *right* side of tongue, also of touch, pain, and thermal sense, but no loss of motion, on this side; *left* side of tongue paralyzed as to motion only, and atrophied; section of left lingual nerve, of hypoglossal, and of right lingual branch of glosso-pharyngeal nerve, injury by splinter of bone of inferior branch of fifth nerve. The man was wounded May 5, 1865, and returned to duty October 20th following. *October 10th.*—The face had recovered sensation and taste was restored to the tongue, although not perfectly. Tact and pain were still absent. *October 20th.*—There was more feeling in the tongue, but no motion on the left side, and no change in the nutrition. Early in this case the patient felt a pricking sensation in the

right side of the throat, far back. After a time a piece of bone, half an inch wide and very thin, escaped into the throat from the part mentioned, and was coughed up, but unfortunately not preserved. It is supposed this splinter was broken off the left jaw and driven across the throat, so as to wound the third branch of the fifth nerve. After the discharge of the bone, recovery was rapid, though no treatment was used.

The differential diagnosis of centric and eccentric cutaneous anesthesia, given in full on page 224, is interesting, but our space will only permit us to refer our readers to it in the book.

As regards prognosis, the form of injury to the nerve has a large influence on this, which, says the author, is always grave, so far as complete functional recovery is concerned, in every instance of severe nerve lesions. In the larger number of cases of pressure by growths, such as exostosis, aneurism, etc., the result of the case will depend, of course, on the ability to remove the cause of pressure. Contusions, for reasons not entirely clear, often give rise, says the author, to more prolonged and serious injury than other forms of mechanical disturbance apparently more capable of locally destroying the nerve. Probably a bruised nerve is more likely to pass into neuritis than even one which has been wounded.

The author withholds his full assent to the common supposition that partial wounds of a nerve are more serious than entire division.

Chapters X., XI., and XII., are devoted to the treatment of nerve-wounds and their consequences. The author opens this branch of his subject by speaking of simple compression and contusion of nerves. Cases of disturbance, arising out of altered mechanical relations of a diseased nerve, during motion, are best treated by passive exercise, and the most gentle but thorough shampooing, if inflammation exist at any stage of the case. Absolute rest, enforced if necessary by a splint, must be enjoined.

Contusions of nerves, followed by numbness and pricking, and a growing tenderness over the nerve-track, and especially if in thin persons the nerve can be felt as a firm, irregular cord, require prompt interference, as we may feel sure we have to deal with an incipient neuritis. These consequences may appear weeks and even months after the [injury, and give rise to the most deplorable results; large functional losses, without any warning either by pain or tenderness, sometimes occur, and the insidious character of the approach should make us watchful. Here the author brings in a number of his rare

and most interesting illustrative cases, which our space will not allow us even to condense. Absolute rest, opiates, and leeches to the course of the inflamed or congested nerves, and the application of cold by means of the ice-bag, were the chief resources and most satisfactory remedies in the hands of the author.

Punctured wounds of superficial branches, giving rise to severe symptoms, are not common in the experience of the author. When such do occur (and the author reports one case caused by the puncture of a fork), subcutaneous injections of morphia, with local dressings, were the only treatment resorted to.

Lancet-wounds of the subcutaneous nerves about the elbow will again become common when the old practice of bleeding is once more fashionable; and though the author seems to think this will surely be the case from present indications, we hope he is wrong; the public health could better afford to suffer the visitations of small-pox, or even another epidemic of Asiatic cholera. We hope the time may never come when any of us shall again see—what most of us of any experience have seen—cases like that of the rogue-patient of Ambrose Paré.

In one case reported, the repeated employment of the following liniment, so as to cause the most severe inflammation of the skin, was followed by relief to the intense pain, and the best results: *R. Ol. olivæ, ʒ ijsa, Ol. terebinthinæ, ʒ jss, Acid. sulph. fort., ʒ j.*

The amount of acid was increased or diminished as was necessary to keep up the inflammation. In injuries to nerves from missiles of war, every precaution should be taken to lessen the chances of deep-seated inflammation and the secretion of pus, something very fatal to the reunion of nerves. The treatment of wounds involving nerves differs in no essential particulars from that of other wounds; the tendency of nerves, from their natural tension, to draw asunder the several ends should be taken into account and obviated by position.

Speaking of muscular atrophy and loss of motion, the author says: "At the United States Army Hospital for Injuries and Diseases of the Nervous System, we very early reached the conclusion that it was wiser in all cases to apply to the muscles the stimulus of electricity, rather than to leave it to itself. I now direct the use of faradaic or galvanic currents from the earliest date at which the healing of the wound allows their use, while with them I combine daily massage or deep kneading, and alternate hot and cold douches. The general result which I hope to attain is the nutritive activity which electricity sustains, and the continuance of a larger supply of blood to the inert

tissues than would enter them if they were not incessantly stimulated and subject to those alterations of temperature, rest, and motion, which belong to the normal state of limbs.

"When once the nerve is repaired, it finds the muscle in a far better condition to profit by this than could otherwise have been the case. Electricity in some form, manipulation, and alternate hot and cold douches, are therefore the three means which I most rely upon to relieve atrophy and muscular paralysis."

Here follow some practical hints as to the manner of using electricity in the treatment of the results of traumatic lesion of nerves, to which we can barely allude, referring the reader to the book itself for much interesting and practical detail. The author regards *manipulation* by shampooing, rubbing, massage, etc., of much value in the treatment of all kinds of palsies. He says the results he has seen obtained by practised rubbers were to be gained by no other equally-rapid treatment.

In the United States Army Hospital, he says, several clever sergeants were trained to act as rubbers. Here also follow details and practical directions for manipulation.

The use of strychnia, the author considers, should be restricted mostly to cases of long standing, and those in which groups of spinal ganglia have been long unused. In such this powerful agent sometimes has appeared to do much good. Its use by hypodermic injections, he thinks, has no advantage over other methods.

The author then speaks of the deformities from changes in the muscles, and, as usual, illustrates by a careful report of a highly-interesting case of gunshot-wound of the left arm, with injury to the ulnar and median nerve, paralysis of motion, and slight diminution of sensation, contraction of flexors, and then relaxation under treatment; atrophy and claw-hand from paralysis of interossei. General improvement took place in the case under treatment.

In the treatment of persistent and painful spasm of muscles from urinal injuries, the division of several tendons was necessary in one case; this, followed by extension on a splint, resulted in recovery. Injections of atropia thrown into the mass of the muscle itself were used successfully. At first this caused increased contraction, but within a few minutes entire relaxation ensued; the muscle never again acted as powerfully, and successive injections, at intervals of a day or two, brought about a cure. One of the most troublesome and mischievous of all the consequences of nerve-injuries—the most fertile in direct and indirect evil—is the inflammation of joints. "Cases," says our author,

"may be doing perfectly well, when suddenly, or slowly, one joint after another becomes swollen, stiff, and painful. When this happens, the members remain as it were set in a false position, into which contractions, palsied or atrophic shortenings, have dragged them. Exercise becomes impossible, from the pain it causes. Absolute rest results for the most part in ankylosis; therefore, the best mode of treatment is that by small blisters, and, as early as the inflammation will allow, to anæsthetize the patient, and use passive motion with freedom. When the joint-maladies are of long standing and neglected, the induced current, or, still better, that from a galvanic battery, should be used, and the adhesions at once broken up under ether or chloroform, the sufferer being fortunate if the state of the muscles has been such as not to alter materially the normal relations of the articular surfaces.

After a year or two, when the smaller joints are enlarged and only slightly painful, they may be slowly reduced by surrounding them with rings of caoutchouc cut from thin rubber tubes and slipped over the joint. At this stage also, the persevering use of galvanism, passive motion, and rubbing, become useful. By these means, when the patient is sufficiently determined, or when, under the resolute rule of a military hospital, his enfeebled will is supported, much good can sometimes be accomplished. Here the author again brings forward his illustrative cases, which all our readers interested in the subject will, we feel confident, take occasion to refer to in this most interesting and valuable monograph.

In the treatment of lesions of sensation, anæsthesia, faradization of the dry skin is the most efficient method of relief; and, as the batteries generally used are too feeble, the author advises the use of the electric brush as the most violent of all the excitements of the skin that do not disorganize its structure. Under this treatment, sensations will sometimes return to regions that appear dead to all sensory impressions. Of the counter-irritants employed, the most useful, the author thinks, is the spirits of turpentine; but, as this is very unequal in its effects on different individuals, care must be used in its employment, as sometimes it will induce for hours the most unbearable pain. The author refers, in illustration of the good effects of irritation, to the case of a soldier who had insensibility of the whole arm, from a fall on the shoulder. He was suddenly and completely relieved, after the entire limb and back had been severely blistered by exposure to the sun. The full feeling of the limb was at once and completely restored. What can be more interesting and conducive to the advancement of scientific knowledge and practical treatment than the record of such

original observations as the above, which are scattered liberally throughout the pages of this valuable book, of which we find it impossible to speak too highly!

Of the use of hypodermic injections to relieve the intolerable pain of nerve-wounds, the author speaks in the highest terms. Twice or thrice a day the resident surgeons passed through the wards, "seeing anguish and trouble in the faces before them, and leaving behind them comfort and even smiles." Sometimes sixty or eighty hypodermic injections were given in the hospital morning and evening. During one year, says the author, forty thousand doses of various narcotics were administered without an accident, and in certain single instances upward of five hundred hypodermic injections were used. The author's experience alone, aside from all others, was sufficient to demonstrate the entire innocence of this mode of medication, and he states it as his deliberately-formed opinion, after great experience, that it is the best, most effective, and constitutionally the least harmful mode of administering narcotics.

Every species of narcotic was tried, and all abandoned but the salts of morphia. The dose ranged from one-quarter of a grain to one and a half grain twice a day. A curious fact respecting its continuous use is stated, that sometimes its hypnotic manifestations lessen while its powers to abolish pain continue; so that a patient who receives half a grain or more of morphia may become perfectly free from pain, and yet walk about with little or no desire for sleep.

As regards the place of injection, it was of little moment; whether it was thrown into the affected limb or into some remote part, the effect was, in nearly every instance, the same.

Speaking of causalgia, or burning-pain, the author says that, of the vast number of means resorted to for the relief or cure of this, nothing has contributed so much to the comfort of the patient as the use of water-dressings constantly renewed, the sufferer carrying a bottle of water and sponge, and keeping the part covered. He says that he never knew any one who could be induced to change this mode of treatment for any other.

Hypodermic injections of morphia, used twice a day, also gave relief; and in this form of disease, unlike most others, something is gained by injecting the morphia directly into the tissues of the affected part. In several cases of severe causalgia, trial was made of injections into other parts, but the patient was sure after the experiment to insist upon a return to the part affected. When neuritis was plainly the cause of the pain, the usual means already referred to were brought into

requisition, though ice on the burning part was too painful to be long endured.

The blistering of the burning part repeatedly with Granville's lotion of cantharides was the best curative treatment. Sometimes as many as ten or twelve blisters were required before a cure was effected, and these should be continued a few times after the burning pain has disappeared, to prevent a return. Here, as usual, the author gives us several of his interesting and well-reported illustrative cases, for which we must again refer our readers to the book.

In Chapter XII. the author discusses the grave question of neurotomy, and says that, when the operation is determined upon, we should not rest satisfied with simple division. Not less than two inches of the nerve should be removed, in order to make reunion impossible. Cauterization of the ends of the nerves with a view to this is condemned, and the practice of doubling the nerve-ends on themselves may be applied to the peripheral, though not to the central end. The author, besides illustrative cases, gives a tabulated statement of the operations for the relief of traumatic neuralgia—the operator, nerve affected, mode of operation, condition of the nerve, immediate and remote result, and remarks as to the subsequent functions of the nerve operated upon.

Chapter XIII. is devoted to the consideration of lesions of special nerves, and is largely made up of reports of rare and interesting cases. That of injury of the sympathetic nerve is especially so, but we can merely refer to it. This case is followed by others, illustrating injuries of the seventh or facial nerve, injuries of the oculo-motor nerves, and the fifth nerve. Chapter XIV., which concludes the volume, is devoted to the several maladies of stumps—chorea, neuralgia, neuritis, sclerosis, etc. Here the author introduces his original study of the vital condition of stumps, before speaking of their diseases.

This much of the subject the author treats under the following heads :

Functional and other changes after amputation; neuromata of stumps; neuro-physiology of stumps; sensibility; sense of pain; motor phenomena; sensory hallucinations; subjective sensations referred to the absent limb; subjective sensations as to motor phenomena in the lost limb, especially as regards position; and lastly of neuralgia of stumps, and choreal spasm with neuralgia, all of which are treated in an original and interesting manner, and, as usual, fully illustrated by rare cases.

But we must now conclude our notice of this book, having ex-

hausted the space allotted to it; but in closing our review we by no means intend to close the volume, but to return to its perusal in order to study more fully and thoughtfully its rare and original contents. We cannot conclude without a word of commendation of the admirable typography of the volume—something, of course, which was to be expected from the character of the house of J. P. Lippincott & Co., from which it issued. No small share of the pleasure we have derived from reading the book has arisen from the admirable manner in which it has been “brought out” by the publishers.

“Behind the Bars.”

THE anonymous work bearing this title¹ purports to be a truthful representation of the management of asylums for the insane in the United States, and of the treatment to which the patients are subjected. It purports also to be written solely under the influence of purely philanthropic motives, as may be learned from the following extract: “No sentiment of hostility, prejudice, or desire to be sensational, impels the pen of the chronicler, but simply a pure desire to make the public understand the condition of a class of persons who come near their common interest, and with whom many are connected who are left in doubt and ignorance as to the system of management.”

That the book is intended to be sensational is evidenced by the title-page itself. That it really is so may be learned from extracts that will be made in the course of this review. And yet there is a tone of earnestness and sincerity throughout the whole that cannot fail to exert an influence on the mind of the general reader. There are also many suggestions valuable to those even who are interested in the management of asylums; not perhaps on account of the value of these suggestions as a guide to improved methods, for they are too vague and impracticable to be of direct service, but as an indication of the feelings and views of certain patients from the stand-point they are unfortunately compelled to occupy.

The senior editor of the *New York Observer*, after quoting several startling paragraphs from “Behind the Bars,” found himself impelled to exclaim as follows: “‘Horrible! outrageous!’ you exclaim, and I join you. And what is to be done about it? If there is such a place on this earth (sometimes called the footstool of God, which seems al-

¹ Behind the Bars. “A land of darkness, as of darkness itself; and of the shadow of death . . . and where the light is as darkness.” Boston: Lee & Shepard, 1871.

most a misnomer when such things are done upon it), the asylum should be instantly turned inside out and reformed, or torn to the ground, and the physicians and women who manage it put into the State-prison." Some of these paragraphs will be noticed farther, on as being the ones most likely to impress the mind of the non-professional reader.

In a review of the book in the *Journal of Mental Science*, the following passages occur: "If the author, in the main, correctly depicts what she has witnessed, there is great need of reform in the system of management of American asylums, which justifies the most urgent demand that the need should no longer be disregarded, and amendment no longer delayed. The paramount importance of the interests concerned, and the principles of justice and humanity involved, lead to the belief that the contents of this little book should not be treated with indifference."

It appears, then, that from the apparent earnestness and the attractive style of the author, the high character of the publishers, the indorsement of Mr. George Lunt, the editor, or from all these causes, the reviewers above mentioned have been strongly impressed with the truthfulness of the book and the great importance of the statements made.

If the statements are substantially true, there certainly are evils that need to be thoroughly exposed and remedied. But, if, on the other hand, they are substantially false, or if the truth is so misrepresented, or so mingled with error, as to convey false impression, the injury done to the community by the book and by the commentary reviews will be very great.

The following facts and considerations will serve to indicate how and how much the community is liable to suffer from the circulation of unjust and unfounded statements against the management of asylums for the insane:

It is a well-established fact that the great majority of the insane cannot be as well cared for at home, during at least the acute stages of the disease, as in institutions especially provided for and adapted to the care of this class of persons. Some of them are so dangerous, noisy, suicidal, or destructive, that they can be cared for at their own homes only at the sacrifice of the peace, comfort, and safety of the family; and yet such patients are even now sometimes sent to asylums with great reluctance and delay, on account of the prejudices that exist in the minds of many people against these institutions. Hence homicides and suicides not unfrequently happen that might otherwise have been prevented.

Those of the insane who are neither dangerous nor outrageous in their conduct are usually less easily managed at home than elsewhere. At home they have hitherto had certain rights and privileges that must now be abridged. Formerly they could go and come, and do as they chose, but now they find themselves watched and restrained in an unusual and, as it appears to them, in an unfriendly way. If hitherto they have been in positions of authority, as in the case of heads of families, now they are reduced to a condition of subjection and dependence. Their supposed enemies are of their own household. Hence arise mutual annoyances and causes of irritation that would be very much less likely to occur if they were placed in the care of strangers. And what strangers are so likely to manage these patients well as those who have been educated to their peculiar duties by a special course of training, and are under the supervision of experts skilled in the treatment of diseases that affect the mind?

For the above reasons, and on account of the extraordinary skill and favorable arrangements provided at asylums, the percentage of cures effected at these institutions is considerably greater than in the same class of patients when treated at home.

There is yet another important and well-established fact that demands especial consideration. After excluding forms that are essentially incurable, mental diseases are of favorable prognosis during the earlier stages, but of very unfavorable prognosis when the disease has become chronic. Hence, if the patient be kept at home under unfavorable conditions during the early and acute stage, the probabilities of a cure are very small, even if the patient be placed under the most favorable care and treatment at a later stage of the disease.

These considerations, which have especial regard to the welfare of the patient, should be sufficient to deter a thoughtful philanthropist from giving currency to statements of doubtful veracity regarding their treatment at asylums; but there are others that are scarcely less important. It is well known that there is a traditional dread and distrust of asylums for the insane. The great mass of the community do not fully know that abuses which were formerly in existence have been long since abolished; that many of the stories told regarding the treatment of patients never had a foundation in truth. Hence their suspicions are easily aroused and their prejudices reawakened by stories that seem to have a respectable supporter. But, notwithstanding their misgivings, some of these people are compelled sooner or later to place a friend, it may be a beloved parent, wife, or child, in an asylum for the insane. In such case the friends may suffer tenfold more than the

patient; for the great majority of insane patients, if not positively happy, are at least comfortable, contented, and far from being unhappy, while those friends must be positively miserable who have serious doubts regarding the manner in which their insane relatives are treated.

Notwithstanding the favorable comments to which reference has already been made, those who are best acquainted with the management of American asylums for the insane can hardly fail to condemn the book entitled "Behind the Bars" as exaggerated in the statement and coloring of facts, highly sensational in style, and, as a whole, dangerously untruthful. The falsehoods are dangerous in character, because the book is well written, has a respectable editor and respectable publishers, and is brought before the world with the indorsement of well-known writers.

The following extracts are adduced as examples of the sensational style in which the book is written. The first purports to represent the manner in which melancholic patients are treated when first admitted to an asylum for the insane:

"Money is of no consideration to the afflicted person who consigns his friend or relative to the hospital, and he endeavors, from his outside stand-point, to direct and provide comfort for the patient; but what is his power or word in the matter? He resigns all right or claim to authority in the giving up of the patient at first. 'Let this man prate and order as he will,' says system, 'money, the love of kindred, the persuasion of all party interest, will not avail with you one hair's-breadth. The patient is ours, body and soul our subject, our experiment. Let them prearrange his privileges, let them order his apartment, let them plead for this or for that, let them pour their money into our lap; all this we oppose not, but against compliance we set our face. Our system is *so-and-so*; shall we break through it for this man's wife, for this loved husband, for this dear daughter, for this son of yours? No; and the headsman is in sight; the axe is glancing which divides affection, interest, humanity, nature, from skill, treatment, power, from necessity, rigor, law, and convenience.' Let us look at this 'very insane woman.' Tell us her history, '*depressed or excited*.' Strangely '*depressed*'—mistress of a happy home, a mother of a family, but fallen into sadness, wearied, aggrieved, despondent, '*run down*'; yet gentle, harmless, tractable as a child. There are many such cases. So many worn-out wives and mothers over whom depression draws itself suddenly like a veil, like a cloud that obscures the sun for a season. And what is the treatment for such? To-night, if not to-day, that lady will be bound; chest, arms, hands, will be com-

pressed, tied into a sleeved corset, as it seems, only it is rough, like tow-cloth; and she will be told to go to sleep. This new garment, this unusual style of habiliment, this of itself is sufficient to 'murder sleep.' She does not sleep, and must pay the penalty. She is watched if she turns, if she struggles to get free, if she strives to rise, if she weeps. She is reported upon, and morning comes with its accusing record written in a 'watch-book' for the physicians' eye, of no sleep; and through grief, wakefulness, wailing, watching, home-sickness, bewilderment, the poor woman is made more frantic with torture and opposition to Nature. *She is locked into this building.* Yesterday at home, with the world to choose from, cherished, indulged, tended with love, with liberty—to-day she is ordered, tortured, harassed, locked up, tied down; to-night, perhaps, worse befalls, and, to make all safe and sure, she is tied to a bed."

Divested of verbiage, the extract above quoted would read as follows, viz.: The feelings and reasonable wishes of those who place their insane relatives in asylums are in nowise regarded by the medical officers. Melancholic patients, who have manifested no symptoms of violence to themselves or others, are immediately placed in a strait-jacket. Furthermore, such patients are systematically harassed and tortured.

It should be noted that the case thus graphically described is not represented as a particular instance that at some time occurred in a particular asylum, nor even as an illustration of the method of treatment adopted in any one asylum, but as an illustration of the *system* pursued in all American asylums for the insane.

No one who is well acquainted with the management of our asylums would hesitate to say that the description quoted from "Behind the Bars" is utterly devoid of truth. Few would be inclined to believe that a single case like the one described has occurred in any American asylum within at least a score of years. If the author knew of such an instance, the proper names and dates should have been published with the account.

The above quotation was made in this connection, however, rather as an illustration of the sensational and exaggerated style in which a considerable portion of the book is written, than for the purpose of disproving or disputing the statements made. The following extract will serve still further as an illustration of the author's style:

"It is a common operation for a doctor or matron, and attendant, to unite their physical force, in order to thrust what is called an eating-tube down a patient's throat, because it may be he did not relish a

dinner of coarse meat and gravy, or a dish of hulled corn and sugar. . . . For instance, a lady patient comes to the dinner-table, where a plate of coarse, tough beef, covered with a thick gravy, and a boiled, waxy potato, are set before her. Her appetite is delicate. She could not eat, perchance, a pigeon's-wing, and this commingled mass is not to her taste. She, knowing the consequences if she does not eat it, applies herself to its mastication after a fashion, and succeeds perhaps in disposing of a part of it, thereby trusting to save her reputation from the stigma of attempted suicide by starvation. In a short time after the brief episode of dinner is over, some attendant reports to the matron that Miss So-and-so refuses to eat; or, if not this, the matron perhaps comes to inquire of the attendants if certain suspected patients maintain an appetite or not; so that often one hears resounding through the long galleries, or up and down the staircases leading from them, the question, 'Girls, did Miss —— eat her dinner?' or, 'How much did Mrs. —— eat to-day?' 'Then she must be fed' is the quick reply to the attendant's report. The doctor is sent for, the patient led off, and placed by the matron in a large restraint-chair, which looks like a chair of war, so gigantic is it in its build and formation. In this the patient is held or sometimes strapped, while the doctor, attendant, and matron, proceed to give her her dinner, as they choose to call it. The matron takes from her pocket a short wooden wedge, which she thrusts into the patient's mouth before she has even refused to open it in the natural way. With the mouth pried open by means of this instrument, the doctor is prepared to thrust a cold tube down the patient's throat, while a bowl of broth or some greasy compound is served to the patient. . . . Young ladies who have recovered their reason, placed in the best wards, irreproachable in every line of conduct and conversation, because it may chance that they do not fancy the dinner or the breakfast, or do not, perhaps, eat as largely as is consistent with the systematic appetite of the asylum, are surprised all of a sudden by the duo or the trio which compose the *corps gastronomique*, and are placed in the ignominious position above described. It is revolting to witness such acts of injustice and barbarity, on the side of sanity and reason, toward imputed insanity and imbecility."

That is, patients who are nearly or quite rational, who are not attempting suicide by starvation, and who are not suffering in any marked degree from lack of food, are systematically fed by force, if for any cause they do not eat quite as much as the attendant thinks they should at any particular meal; no attempt being made to induce them to take food by persuasion, by change of diet, or by any other means.

Only two reasons are given for this mode of treatment: the one is for the purpose of torturing the patient; the other, for the purpose of retaining him in the asylum, by telling his friends that he requires to be fed.

It seems hardly possible that any reader of ordinary intelligence should give a moment's credence to statements so manifestly untrue; for, if they were true, how does it happen that only one of these many rational patients has dared to tell the story? or, how is it that all or nearly all the educated physicians in charge of asylums are so thoroughly brutalized, and yet are able to support the character of humane and sympathizing men for a long series of years? These are the very passages, however, that have been quoted by intelligent men as though they were worthy of credence.

The term *system* constantly recurs throughout the book; and by this is meant, not merely the fact that there are certain rules and methods which are applied with proper discrimination and adaptation to the different asylums in accordance with varying circumstances and conditions, but that an arbitrary, unreasonable, oppressive, inflexible rule is adopted and carried out in all cases, without regard to the good or requirements of particular patients or the feelings of their friends, but rather for the express purpose of injuring the former and annoying the latter. The following quotations will serve to establish the truth of this criticism:

"Let this man prate and order as he will," says system, "money; the love of kindred, the persuasion of all party interest, will not avail you one hair's-breadth."

"It would overthrow the *system* at once to permit interviews."

"But the modern system of treatment of the insane proves," etc.

"Blessed independence of social government that systems do not allow. Let any man presume to maintain his own inherent eccentricity, idiosyncrasy, or whatever may stamp his personality, let him indulge in his own whim of opinion or habit of life, by his form of speech or expression within the tabooed domains of an asylum, and unless this be on a footing with the codes of uniformity there prescribed, unless it reach the wonted standard of this or that line of government, he may as well begin to study the art of doffing his true character, of suppressing and merging himself into the imaginary man or woman of system's carving, into the image of the figure-head that is chiselled in wood and serves as a model for all which says, 'Until you cut yourself to my pattern, abandon hope; until you learn to give eye for eye, to pay off system in its own coin, you have no

more chance of escaping from these walls than if *habeas-corpus* or personal-liberty bills had never existed.'"

"How can one break through a deliberate system?"

"No system that seeks to bind, to narrow, to nail the immortal part of man, as it would tie a hand or foot, is an intelligent one."

"Why not break through a false and narrow system?" etc.

"Let us remember that here are men and women of all ages and conditions of life, placed under regulation and discipline which do not by virtue of the right of birth belong to them. They are managed by codes and decrees as stiff and rigid as those of any prison in the land. They are marshalled out and ordered in at exact hours; they are compelled, forced, confined, locked up, tied up like refractory sheep, at a signal of disobedience, and their life is like that of the inmates of a house of correction or school for reformation."

"The same fiat that goes forth to bind the reins tighter for the rebellious or riotous patient, the same watch that keeps close upon the movements of the sly and cunning evader, are not varied to suit this or that shade of the disease, but the rule falls alike upon all. There is no respecter of persons or of types. It declares war to a race, not to a clan or faction."

"There is one mechanical idea and opinion, one particular channel of freedom, which controls erroneously the whole system for the insane."

"Why must the convalescent be subjected to the rigorous rule and implacable system of that prescribed for the violent, noisy, and positively very insane patients? Why must a lady, because she is depressed, and is too homesick to talk to those around her, who is gentle, amiable, and harmless as a prison-fly, why must her hands and arms be tied up at night to insure her personal safety? But this is a feature of the system."

"The deliberate rules enforced here are to oppose, to thwart, to baffle, to deny you every whim, wish, or fancy."

"Opposition is the system around which the asylum sun revolves."

"This petty opposition is so general, that it is usual for pretty bright patients, if they wish not to do a thing, to beg to do it, and in that case they are sure to be let off."

"That the plan adopted for years past in our insane asylums is wrong, cannot be doubted by any intelligent being who has seen the victims of such a system."

"Opposition is the law, down to the very minutest trifles of the present system of asylum-life."

It seems hardly necessary to say that no such *system* as the one above represented exists in our asylums for the insane. There are, certainly, rules and regulations which are general in their application; as, regarding the hours of rising and retiring, of taking meals, bathing for the purpose of cleanliness, etc. These general rules, however, are suspended or modified just as often as the requirements of particular cases demand. They very frequently are thus modified. The statement that *opposition* is the *system*, deliberately enforced, is altogether untrue. Nor are the patients all treated alike. The requirements of each are habitually taken into consideration as regards medicine, diet, exercise, work, amusements, and association. Those patients are placed in the same apartments who are thought most likely to be agreeable to each other, or least likely to disturb each other. Great stress is laid by all medical superintendents of asylums on the provision of proper means for classification, and patients are classified and associated on the principles above mentioned, rather than in accordance with the particular type of disease with which they are afflicted. The following passages, selected from a large number, will serve to show the manner in which the physicians who manage asylums are spoken of throughout the book. Nothing better is said of them elsewhere:

"Now, the treatment of the insane, physical and moral, is a topic that has fretted the sound minds of this country and Europe from the dawn of science itself. But, notwithstanding all the experiments to which it has been subjected, very few have resulted in hitting the desired mark, and very little light has come out of the darkness. Much amelioration, however, has ensued, which is the result rather of modern philanthropy than of science."

"How many are this moment passing to the cold embrace of science, to the ignorance of treatment!"

"The system is caught up by the attendant, and suffered to stand as a rule of conduct and government by the doctors, who estimate attendants by their harshness rather than gentleness."

"The doctor's visits through an asylum are 'angels' visits' in one sense to the patients—cursory, ceremonious, mechanical. It cannot be denied that there may be exceptional instances, where the physician acts as friend, guide, adviser, and will put himself on the same footing as the patient for the sake of his patient, and the writer has seen such; but what says the governing system of these? That they are in the wrong. It simply opposes them, thwarts them, denounces them, and finally excludes and banishes them, and scorns to acknowledge them as members of their perfect discipline. The plain truth is, that a too humane physician gets his patients well too fast."

The physicians are represented as being especial *obstacles in the way* of the recovery of patients. Science and physicians have done nothing to ameliorate the condition of the insane. Whatever has been done has been accomplished by *modern philanthropy*.

Now, it is a well-known fact that, as in advocating measures for the preservation of health and the prevention of disease, such as improved methods of ventilation, general sanitary provisions, vaccination, disinfection, etc., and in the establishment of hospitals and dispensaries, physicians have always taken the initiative, have been the agents without which these humane measures and institutions would never have had an existence, so whatever improvement there has heretofore been in the care and treatment of the insane has been directly due to the precepts and practice of physicians engaged in the management of asylums.

Throughout the whole book it is represented that the system of treatment at asylums is secret; that patients are debarred for months and even for years from the privilege of seeing their nearest relatives and natural guardians; that oftentimes they are not allowed to receive any information about the outer world or about their own friends and affairs; and that they are not even allowed to write to their friends. Highly-colored instances are related at great length in support of these assertions. The following quotations will suffice to indicate their general character:

"We treat it (insanity) socially as it is treated physically, not philanthropically but scientifically, which means *in secret*."

"It would overthrow the *system* to permit interviews; because one of these might have the immediate effect of sending a patient home."

"Are domestic peace, sanctity, harmony, nothing, that they must be kept at bay, and swayed by the monopoly of an ulterior power, by the formidable etiquette of scientific analysis and ambition, by the usurpation of remedy over disease, by the greed of secret curative systems?"

"Seemingly, to all intents and purposes, the system has no secrecy. But woe unto you, Scribes and Pharisees, hypocrites! . . . Are not these trustees, these pure-minded, unsuspecting gentlemen, the very cloak under which all this secret poison is administered?"

"Herein lies the safety of the secret system, for 'dead men tell no tales,' and *the living dare not speak!*'"

"Who shall say who suffers most, the imprisoned one or the one left outside forever, knocking at the door?"

"It is the question of *secret* or *open* management."

"This" (correspondence) "by the present system of treatment is entirely forbidden; no patient is allowed, however well or natural, even in the convalescent wards, to hold correspondence outside, or even, in fact, within the hospital."

"It is natural to suppose that, although personal and epistolary intercourse is forbidden, there is some satisfactory account given to the patients of the visits of their friends, and of what may chance to be left in the way of messages with the doctors who hold such frequent intercourse with them. But this is not granted."

One passage occurs in which the admission is made that visits from friends and the privilege of writing are allowed "in the State hospitals, at least those that are well ordered." This admission, however, is not likely very much to modify the impression left on the mind of the general reader by the many passages in which the opposite is asserted in general terms.

The real practice is as follows: Patients are generally allowed to write to their friends whenever they desire to do so, and their letters are sent, unless too foolish or too frequent. They also write many foolish letters to governors and others in authority, to lawyers, to strangers, or to ordinary acquaintances. These are withheld, and for obvious reasons. If a letter contain proofs of insanity, it is of advantage only to those immediately interested in the welfare of the patient. Letters written by insane patients, which contain no indications of insanity, if sent to unwise philanthropists, are likely to cause much annoyance to the patient's friends, and to injure the prospects of the patients themselves, in case of recovery.

The insane are usually injured by visits from friends immediately after admission to an asylum. They are also injured by too frequent visits during the acute stages of the disease. Hence, visiting is restricted in such cases. In other cases the privilege is practically unrestricted.

After the acute stage of insanity has passed by, visits from friends are encouraged. Superintendents of asylums strongly recommend that these institutions be located as conveniently as possible to the sections of country from which the patients come; urging, in support of this recommendation, the fact that patients are placed under treatment at an earlier stage of the disease when the asylum is conveniently located, for the twofold reason that then patients are taken to the asylum with little trouble, *and may be visited without great inconvenience and loss of time*. Visits from casual acquaintances and inquisitive neighbors usually are, and no doubt should be, interdicted.

The author of "Behind the Bars" repeatedly states that the object of this secrecy, this prevention of the visits of friends, is for the purpose of enabling the asylum management to retain patients who have recovered and have remained well a long period of time; that "this is one of the very reasons why friends are so strenuously debarred from entrance there. It would overthrow the *system* at once to permit interviews, because one of these might have the immediate effect of sending the patient home. . . . An accident might free them at any day; a fellow-patient might report their cause aright, and lo! the doors would be opened, friends would walk in and take the odds upon themselves to let them out. Thus it would be incessantly proved that the asylum was supported by a class who need *not be there*. There are two-thirds or more of such patients in asylums. To be sure, the end does come, and they are sent home; but why are they detained a year or more beyond what necessity demanded?" A sufficient reply to all this is that visits are not thus restricted, nor are patients who have recovered thus retained.

Severe cases that have made a slow approach toward recovery are certainly oftentimes retained for several weeks or months after they have become rational in conduct and conversation. If too early deprived of the means that have led to restoration, a relapse is very liable to occur, and this is often much more serious than the first attack. A broken bone may be well enough united to retain its position under careful handling at the end of three weeks, but not strong enough for ordinary use at the end of six. So a damaged brain may be sufficiently restored to perform its functions properly under especial safeguards at a given date, but not sound enough to bear the excitements, duties, and trials of ordinary life, until another date more or less remote. Two or three months' stay at an asylum is sometimes thought advisable after convalescence has commenced. Almost invariably patients who are really convalescent freely acquiesce in the advice of the physician and their friends regarding their prolonged stay at an asylum.

The preceding quotations and remarks will serve to indicate the style and general character of the misrepresentations to be found on almost every page of "Behind the Bars." There are many others, of which a limited space will not permit the mention.

But the good advice and correct principles enunciated in connection with these misrepresentations are hardly less injurious in their influence than the misrepresentations themselves, since they are so contrasted as to convey the impression on the mind of the general reader

that these principles are not accepted as true, or carried into practice at our asylums. The good advice given also renders the reader more likely to believe that the misrepresentations are true.

The following extracts from the rules for the government of attendants at the Pennsylvania Hospital for the Insane will serve to indicate how uncalled for even the *good advice* is that is contained in "Behind the Bars." The same principles and substantially the same rules are adopted at all our asylums:

"*Duties of Attendants.*—In all their intercourse with patients, the attendants are to treat them with respect and civility, are to address them in a mild and gentle tone of voice, and avoid violence and rudeness of every kind. All civil questions are to be properly answered. All reasonable requests are to be promptly attended to. They are to keep cool under every provocation, are never to scold, threaten, or dictate authoritatively; but, whenever they desire any thing done by a patient, are to make a request in a respectful manner."

"Force, unfortunately, has sometimes to be used in every institution for the insane, but tact and kindness render its employment comparatively rare, and, whenever it must be resorted to, the manner of using it may be made to take away nearly all its offensiveness. A pleasant smile, a cheerful, kind, and respectful manner and sympathizing words, will go far to convince even the most excited patient that what is done is from good motives, and that he has little to fear from those around him."

"Under no circumstances will an attendant be excused from striking a blow, or laying violent hands upon a patient, unless in the clearest case of self-defence, or to prevent his committing serious injury to himself or others."

"They must never allow patients to be laughed at, ridiculed, or harshly spoken to, on account of their delusions or peculiarities of behavior."

"Deception is always to be avoided, and particular care is to be taken that promises are not made that cannot be performed."

These and similar precepts are inculcated, and as far as possible enforced, by the medical superintendents of all asylums for the insane. They are principles in regard to which there is no difference of opinion among them. It will readily be acknowledged, however, that attendants do not always perform their duties in accordance with the instructions they receive. As there are some mothers who, through lack of knowledge, lack of ability, or through ill-nature, neglect or abuse their children, so there are sometimes attendants who neglect or abuse the

patients placed in their care. Such attendants are instructed, reprimanded, or discharged, in accordance with the nature of their offence, and what is judged to be for the best interests of the patients. It is not true, as stated in "Behind the Bars," that the story of the attendant is always credited, and the story of the patient discredited. On the contrary, attendants are sometimes discharged on the evidence of patients alone, and with reason and justice. Some insane patients are known to be eminently truthful and trustworthy in certain matters. So, too, the corroborative testimony of several patients may form more conclusive evidence than the testimony of the same number of sane persons of the same grade of intelligence and moral culture, for the reason that the insane are much more rarely in collusion than the sane. But, with all the care and supervision that can be bestowed, certain faults are liable to occur, which, if duly magnified and exaggerated, if gleaned from the experience of a number of years and of several institutions, may form a sort of basis to such stories as some of these detailed in the book which is the subject of this review. Such exceptional cases, when embellished, exaggerated, and represented as parts or the direct results of a *system*, are no less untruthful and are more prejudicial than stories that have no foundation whatever.

A careful analysis of the contents of "Behind the Bars" has given us, as a result, a fair degree of literary merit in style and in general interest, if the book be considered in the light of a mere fiction; a large share of untruthfulness and of the exaggeration and distortion of facts, if its real claims are taken into consideration; the enumeration of certain principles that ought to be and in fact are embodied in the rules promulgated and enforced in all our asylums; and a graphic representation of the views and feelings of certain patients regarding asylum management from their peculiar stand-point. If the book have a sphere of usefulness at all, it must be in the respect last named, for physicians who treat the insane need always to keep carefully in mind the possible views and feelings of their patients, in order that they may remove all avoidable causes of irritation. Few patients are likely to express their adverse views and feelings in stronger terms than the author of "Behind the Bars." In all other respects, and for all other readers, the book is much more likely to do harm than it is to do good.

Many of the readers of the *PSYCHOLOGICAL JOURNAL*, who are little acquainted with the management of asylums, will very naturally inquire how it happens, then, that the book has been noticed with considerable favor by both non-medical and by medical reviewers. The

answer is, that the reviewers evidently did not make a careful analysis of the contents of the book, and had no other sufficient and reliable sources of knowledge. The author of the review in the *New York Observer* confesses to misgivings regarding the credibility of the book. He says: "One great defect must in fairness be stated, and that is, that no names are given of author or institutions. We are, therefore, left to fear that the writer was unwilling to face the responsibility of the statements he makes, or to give an opportunity to the accused of making a defence." And yet, throughout the whole of the rest of the review, he treats the book as though it were entirely credible. The inconsistency between the doubts expressed and the general tone of the review serves to illustrate how easily deceived and how credulous men are who are not habituated to the strict methods of scientific research.

But the reviewer of the *Journal of Mental Science* must be supposed to have been thoroughly trained in scientific methods. Some other explanation, then, must be given to account for his faith in "Behind the Bars," and more particularly since, in reply to a courteous letter from Dr. Isaac Ray, in denial of the statement that "mechanical restraint was often applied by attendants at their own will and pleasure," he reasserts his belief in the truthfulness of the book, saying that he has received from other quarters, and from authority that certainly should be reliable, positive assurance that there is not any exaggeration in the book; but that, on the contrary, much has been kept back which might seem incredible. The book itself would certainly seem to be *reliable authority* after the indorsement it has received in the *Journal of Mental Science*. A non-professional writer might be excused for referring to it as authority, on the strength of this indorsement, and yet, as has already been shown, the statements and representations made in "Behind the Bars" are in the main untruthful. There is no reason to believe that this "other authority that should be reliable" is any more trustworthy.

The statement of a few facts may serve to explain why certain English physicians are so ready to credit improbable stories about the management of American asylums.

For many years past there has been considerable difference of opinion between the medical superintendents of asylums in the United States and certain English superintendents of asylums and lunacy commissioners, on the subject of mechanical restraints; and these differences of opinion have sometimes been rather sharply stated.

The *absolute non-restraint* school of English physicians hold that

the application of mechanical restraints is a cruelty, is wholly unnecessary, and is only a relic of the barbarism of former times which Pinel, Connelly, and others did so much to abolish. Instead of in any way confining the person, they advise appropriate medicines, baths, moral suasion, and if necessary the hands of a sufficient number of well-trained attendants. They make no exceptions to be applied to individual cases; and are of the opinion that, whatever the characteristics of the race or community to which the insane patient belongs, no modification or relaxation of the rule of non-restraint is required. Hence they are ready to condemn and do condemn the managers and management of all asylums in which mechanical restraints are used.

In regard to the subjection of the insane to some sort of restraint, there is and can be no difference of opinion. The only question is regarding what the restraint shall be. The necessity of restraint, of government, of the subjection of the wishes, judgment, and will of an insane person to the wishes, judgment, and will of those who are sane, depends on the primary fact that the mind of the patient is disordered, and incompetent to the proper performance of its functions. An insane person may be disinclined to remain at home, or at an asylum, or to wear clothing; or he may be destructive, violent, or suicidal; and unfortunately no amount of persuasion is certain, or even likely to exert a very great and immediate influence on his views and actions. Hence he must be compelled to do what he does not like, whether by means of walls, bolted doors, barred windows, and confinement of the person as the case may require, or by the constant supervision and active control of others. In either case it is universally conceded that moral influences should take the precedence of coercion; that *willingness* should, if possible, be secured by moral means.

American superintendents of asylums hold the broad view that all these methods are proper, and may be required; and that their employment should be at the discretion of the physicians in charge of asylums, on the same principle that the administration of remedies in particular cases should be left to the discretion of those general practitioners of medicine who undertake their care. Medicine may be injudiciously prescribed, or it may be withheld when it should be administered. So restraints may be unnecessarily imposed, or on the other hand they may be withheld to the detriment of the patient, and of other persons with whom he is associated. Methods of procedure that may be required under certain circumstances, and in treating patients of a particular temperament, education, and nationality, may not be required in treating other patients with different characteristics

and under different circumstances. The people of the United States are particularly excitable in temperament. They also have what Englishmen might be inclined to consider exaggerated notions of personal sovereignty. Hence, when they become insane, they are more restive under the personal authority and control of others than are those who during their whole lives have been accustomed to look upon the constituted authorities with a respect almost akin to reverence. If controlled by the physical force of attendants, when force becomes necessary, some of these patients become greatly excited, and make strenuous and continued resistance, although they quietly submit to control when mechanical restraints are applied. American superintendents very naturally claim that they can judge better of the requirements of cases that are under their immediate observation than can physicians who are several thousand miles away, and whose patients are of a different temper.

As English superintendents condemn the use of mechanical restraints in American asylums, so rather sharp criticisms have appeared in this country on the treatment of patients in English asylums under the so-called *non-restraint system*. It is asserted that in English asylums depressants and narcotics are used as *drug-restraints* when there is no remedial indication for their use, when, in fact, they act injuriously on the physical condition of the patient; that *refractory baths*, in which patients are confined by the neck, as culprits formerly were in the stocks, are used and *continued* longer than cleanliness or any medical indication requires; that patients are left in rooms by themselves in a nude state, who might with advantage be associated with other patients under some form of mechanical restraint, for at least a portion of the time; that the exercise of force by attendants at English asylums, in controlling patients, not unfrequently results in causing fractures of a serious nature, and sometimes even in the death of the patient; and, moreover, that the *extreme non-restraint* practice in England is brought about by public opinion and prejudice rather than by the unbiassed judgment of medical superintendents of asylums.

These criticisms are not rendered less annoying by the fact that English superintendents sometimes express themselves as not altogether in favor of the extreme non-restraint system. Thus Dr. Yellowlees says, "Non-restraint is a good thing *only when and just because* it is the best thing for the patient." Dr. Blandford says, in regard to restraining patients who require to have food administered by force, as follows: "Recollect that no grasping on the part of a number of attendants can hold a very powerful patient motionless, because they

are not all the time acting together. The patient is to be placed in a wooden arm-chair and his body, arms, and legs, are to be swathed in sheets drawn through the arms and legs of the chair so as to render him immovable. . . . Doubtless some will talk about mechanical restraint, and so forth; to these I would say, compare a patient struggling from fifteen to thirty minutes in the hands of three or four attendants, with one fastened with sheets in a chair for five minutes. Let both be seen before judgment is passed."

The *Journal of Mental Science* supports the extreme non-restraint doctrine; and the views of its editors are quoted with approval by the author of "Behind the Bars." Whether this has exercised a blinding influence on the views of the writer of the criticism or not, it is difficult to judge; but at least enough has been quoted from "Behind the Bars" to show that he might have found abundant internal evidence of exaggeration and misstatement had he been so disposed.

P.

The Ophthalmoscope in Diseases of the Nervous System.

WHATEVER may be the advances made by pathologists in the appreciation of general nervous disease through the avenue of the eye—and that such advances will be made is certain, for the study is yet young—to Clifford Allbutt will still belong the credit of having put forth the first complete treatise on the subject,¹ a treatise which is likely to remain for some years the standard text-book to which all must turn. The use of the ophthalmoscope in diseases of the eye, for the purposes of oculists, is practised by not a few, and the gain to be derived therefrom is appreciated by many who make such disease a special study; but those who have tried, by means of this instrument, to diagnose diseases of the brain and nervous system, are few, and, though the publication of the book before us will doubtless serve as a stimulus to students, and lead many more to labor in this field, yet we may tell off on one hand those speaking our language who have by their writings, prior to Dr. Allbutt, contributed to our stock of knowledge of such matters. In fact, it is not more than a dozen years ago that Von Graefe, in his well-known essay, drew attention to the ophthalmoscope as of great value in treating the diseases of the eye. Dr. Allbutt tells us that Dr.

¹ "On the Use of the Ophthalmoscope in Diseases of the Nervous System, and of the Kidneys, also in Certain Other General Disorders." By Thomas Clifford Allbutt, M. A., M. D., Cantab., etc., etc. London and New York: Macmillan & Co., 1871.

John Ogle, of St. George's Hospital, first called his attention to the probable results of ophthalmoscopic examination in cases of cerebral disease, and published a paper on the subject, more than ten years ago, in the *Medical Times*; and we think we are correct in saying that, almost the only other English physician who has written on this special branch is Dr. Hughlings Jackson, to whom this work is dedicated, and who began to use the ophthalmoscope in London at about the same time that Dr. Allbutt commenced to use it in Leeds. In America, Dr. Noyes, of New York, several years ago made important contributions to this subject.

We are told in the introduction that it is not the writer's purpose to treat of such matters as palsies of the orbital nerves, nor of the optic nerve, merely as one deviation from the normal among the many which constitute the several combinations significant of certain and several cerebral lesions. The affections of the optic nerve and retina are what he is concerned with, as shedding light upon pathology and diagnosis, and as being concurrent with many lesions of distant organs.

The early chapters are devoted to an account of the examination of the eye, and to a description of the aspect, structure, and connections of the normal optic nerve and retina. The student of ophthalmology would gain some useful hints from the perusal of the first of these, but we pass them by for the present.

In the fourth chapter the author considers the variations from health of the optic nerve and retina. The first class of changes described are those which occur in the circulation, and are not attended by any sensible deterioration of structure; these are not to be referred to a standard of optic neuritis, but to a standard of health. The parts to be watched are the optic disk, the retina, choroid, and blood-vessels. "The optic disk is liable to anæmia, to simple congestion, and to congestion with effusion, within or around it; to inflammation of its outer sheath, to inflammation in its substance or inner sheath, and, lastly, to atrophy. The retina is liable to serous, fibrinous, and fatty exudations or patches, more especially in the course of the vessels; also to hæmorrhages. The choroid is liable to loss or disturbance of its pigment; also to hæmorrhages. The blood-vessels are liable to many characteristic changes—to diminutions or obliterations, to dilatations, to tuberosities, to pulsations, to varicosities, to blood-stases, embolism, and thromboses, to diseases of their coats and to rupture. We are warned at the outset that many peculiarities which, to the unwary observer, appear to be marks of disease, are in no way of evil

meaning. Not only do we find such peculiarities as white patches on the retina, and white rings, or rings of pigment, upon the margin of the disk, which varieties may be congenital, or may be mere harmless changes having no special meaning, but we find variations also in the color and vascularity of the optic nerve, which, at times, may be puzzling even to a practised observer." The first two conditions mentioned are hyperæmia and anæmia of the disk and retina. The causes of the former are various. "It may be the first stage of full ischæmia, of neuritis, or of an atrophic process; or, again, it may be due to orbital disease, to choroiditis, or to Bright's degeneration—slight degrees of it are not uncommon in drunkards; but in a very great number of cases it is due to encephalic disease—to tumor, acute or chronic meningitis, or to changes in cerebral vascularity, which may be attended with convulsions or mania. The presence of hyperæmic and anæmic conditions of the disk and retina in convulsive and maniacal diseases is of high pathological interest.

It is frequently stated, and stated with a confidence which is quite unjustified by any complete or accurate observation, that the sympathetic nerve-system is endowed with great power over the vascularity and nutrition of the optic disk and retina. Fancies about the sympathetic nerve are now very fashionable, and their mysterious agency is called upon every week, every month, and every quarter, to explain all sorts of phenomena, or supposed phenomena, in healthy physiology, morbid physiology, and therapeutics. The less the writer and the reader know about the sympathetic nerve-system, the more satisfactory, of course, is the explanation. It is asserted, in most ophthalmic treatises, that paralysis of the sympathetic in the neck causes hyperæmia of the optic disk and retina. This may be so; indeed, I am far from saying that it is improbable, but, so far as I know, it is wholly unproved; nor do I find any proof of this assertion in the writings of those who repeat it." Dr. Allbutt is very decided in his rejection of the part which the sympathetic nerve-system is supposed to play in diseases and disorders of the brain; and, for our own part, we to a considerable extent sympathize with the objections he alleges, but we wish that something could be done to bring this matter to an issue, for assertion on the one hand, and denial on the other, are all that at present we have; and here, after the passage we have just quoted, we turn the page and read that anæmia of the disk may be due to vascular spasm. We do not know what Dr. Allbutt considers as the exact pathology of vascular spasm, but we think that this term, as indicating the probable condition of an epileptic, is closely allied in many

respects to the "mysterious agency of the sympathetic," and that it is certainly like it in that, while it is not improbable, it is wholly unproved.

After speaking of œdema of the disk, which, he says, often occurs as a complement of other affections, as neuritis, anæmia, or embolism of the central artery, the author passes to the condition known as *ischæmia*, or choked disk, one which, our readers are aware, is attracting considerable attention at the present day. "I gradually became assured that many of the worst cases of so-called optic neuritis are really mechanical congestions or venous arrests, differing essentially and importantly from inflammations. I attributed this stoppage to pressure upon the cavernous sinus." But Von Graefe pointed out that this must depend also on the concurrent action of the sclerotic ring. "This action of the sclerotic ring makes us to form most accurate opinions upon degrees of pressure within the skull." But, unfortunately, "*ischæmia* of the disks may often, but cannot always, be distinguished with the mirror from optic neuritis, as the two are frequently associated." We think this is true, and that it is a difficulty which will stand in the way of many, especially of beginners, who are trying to diagnose the disease of the brain, of which one or other of these is an indication. We turn to the differences between them as given by Dr. Allbutt. "Pure neuritis presents the following appearance: the nerve is swollen, but less so than in *ischæmia*, and it does not present that steep elevation of one side so characteristic of *ischæmia*. The vessels, again, are of somewhat different appearance. There is not the same bursting into view of a multitude of minute branches and capillaries, which may give so mossy a look to *ischæmia*. The distention in neuritis is more an enlargement and tortuosity of the main trunks, though, of course, there are many more vessels to be seen than in health. As in *ischæmia*, the arteries become thin and indistinct, and there may be numerous minute hæmorrhages in and near the disk. The color of the parts, again, is distinctive in well-contrasted cases. In neuritis we do not see a circumscribed intense redness or brownish gray, but rather a wash of reddish lilac, or a gray tint, and the tint, which is more uniform and more opaque, also extends more widely upon the retina than in *ischæmia*, and conceals more or less even of the large veins which converge toward the disk. The vessels, especially the veins which lie deeper embedded in the dense new formation, dip in and out, or dive wholly out of sight for more or less of their course. The parts often have, too, what Mr. Hutchinson calls a 'woolly' appearance, due perhaps to œdema."

Ischæmia, then, is a choking or congestion of the disk, the causes being those changes within the skull which more or less directly distend the ophthalmic veins. "The three main causes of ischæmia, with the subsequent atrophy, are—1. Meningitis; 2. Hydrocephalus; 3. Tumors. It seldom or never results from acute or chronic softening of the central substance, from hæmorrhage, from sclerosis, or from arterial degenerations." Optic neuritis, on the contrary, is inflammation of the optic trunk. It is not confined to the disk, and the connective tissue of the nerve is probably the active agent, the nervous elements suffering by implication. But we read that, in meningitis, neuritis is often complicated with or preceded by ischæmia, as the inflammatory change may invade both the nerve and the membranes which form the sinus, so that it becomes choked with coagula, or by the accumulation of exudative products above, and a differential diagnosis becomes impossible. All this points to the difficulties that await the student, difficulties necessarily attending the infancy of a study which will, we trust, year by year diminish as the number of observers is increased. The other morbid conditions are chronic optic neuritis, retinitis—not to be confounded with the retina of patients suffering from albuminuria—perineuritis, consecutive atrophy—atrophy in which ischæmia and optic neuritis may end—and primary atrophy. For all these appearances we must refer our readers to the book, for all that is said of them is of the highest importance, and cannot be reproduced in this place.

The fifth chapter is upon the relations between certain intracranial disorders and affections of the optic nerve and retina. The disorders are epilepsy, chorea, mania, dementia, meningitis, tubercular and others, concussion and fracture, hydrocephalus, intracranial tumors, atheroma softening, and hæmorrhage, cerebritis, abscess and sclerosis, general paralysis. It is obvious that, in the examination of the pathology of these disorders, and in the attempt to illustrate this by ophthalmoscopic observation, questions of the most profound significance arise, involving, in fact, the whole of cerebral anatomy, morbid and normal. It is not to be supposed that all difficulties are likely to be at once solved by this method; nevertheless we have great hopes that by it light will be thrown upon many points hitherto obscure. So vast are the differences of opinion as to the nature of many of these disorders, that we have first to criticise what Dr. Allbutt says upon their pathology, and then to examine his inferences from his ophthalmoscopic examination, and space forbids us doing more than glancing at all this.

This is the first stand-point, that uncomplicated optic neuritis is a rare event. And this he asserts after making all due allowance for the fact that ophthalmic surgeons have recorded cases of optic neuritis as occurring in persons who have no cerebral disorder; it is, however, a rare event. Setting aside all cases where the cause of change in the nerve originates without the cranial cavity, we may say that the occurrence of papillary ischæmia, or of optic neuritis, in any person, ought to awaken the greatest suspicion of cerebral disorders.

Commencing with epilepsy, our author tells us that, notwithstanding the difficulty of examining a patient during an epileptic fit, he has managed to see the disks distinctly during the convulsions in many cases, and has given careful descriptions, in writing, of six. In three of these an anæmic condition of the disks was seen, and in three an hyperæmic or congested condition. All those of the latter class were cases of prolonged convulsion alternating with times of stupor. Observations of Dr. Hughlings Jackson and Mr. Carter go to support the belief that a very decided anæmia of the optic disks is a frequent if not constant phenomenon during the epileptic convulsion. And the venous hyperæmia, sometimes noticed, is, as well as anæmia, a condition in which arterial supply is suppressed. Thus the ophthalmoscopic appearances favor the theory that epilepsy depends on arrest of the blood-supply of the whole or some portion of the brain, whether this arrest be by way of vascular spasm, by anæmia, or by nervous congestion. Optic neuritis, ischæmia papillæ, and atrophy, are as rare in epilepsy as they are common in symptomatic convulsions. Neither are they found in simple chorea; in fact, here there is no change even in the vascularity of the disk and retina. In mania, Dr. Allbutt has noticed a vascular suffusion or pinkness, a pinkness so great, after severe paroxysms, as to obscure the disks. In one case, examined during a paroxysm, the fundus was anæmic and the disk rather white, and this may be noted as suggesting that mania, like epilepsy, may be due to vascular spasm. "My observations of the hyperæmia of the eye after the paroxysms correspond closely with the state of hyperæmia of the brain noticed after death in such cases. Should my statements be verified hereafter, either by myself or by other more competent observers, the state of the disks and retinal vessels in mania will be a remarkable proof of the close dependence of their circulation upon that of the brain, and will add much to our confidence in reasoning from the one to the other. As a means of diagnosis it will be seen that the use of the eye-mirror in the investigation of insanity is chiefly for the distinction of 'organic' from 'functional' disease. As in epilepsy, when the

mania is sympathetic of 'coarse disease,' we find permanent changes in the disks, due either to obstruction to the intracranial circulation, that is, to ischaemia, followed perhaps by atrophy, or due to neuritis; or, again, to simple progressive atrophy. No such changes occur in 'functional' mania."

Whereas, in chorea, little or no assistance is afforded by the ophthalmoscope, and in such diseases as general paralysis and encephalic tumor its discoveries have important pathological meanings, in meningitis, especially that form called "tubercular," it gives most valuable help to diagnosis. This disorder Dr. Allbutt thinks more common and less uniformly fatal than is generally supposed, and he is of opinion that great light will be thrown on the question by the eye-mirror, inasmuch as at present the mild cases which recover are open to doubt, difficult of diagnosis, and liable to be pronounced to be something else, and not tubercular meningitis. According to him, cases of recovery from this disease take place, and he quotes an opinion of Dr. Crichton Browne, to the effect that idiocy is sometimes the effect of tubercular meningitis in early years. The question, however, remains, How constant are the evidences of the ophthalmoscope in undoubted cases of tuberculous meningitis? Of thirty-eight cases watched till death, he found ophthalmic changes in twenty-nine, and for the most part found them on the first examination. "The changes were, most commonly, marked degrees of hyperaemia of the retinal vessels, which become clouded, swollen, dark, and tortuous. These changes were often traced up to the full development of ischaemia, which appeared next in frequency. Neuro-retinitis I found in six cases." Rarely, but occasionally, tubercle is seen in the choroid. Dr. Allbutt discusses at great length the subject of intracranial tumors in various regions, their diagnosis by means of the ophthalmoscope, and the method in which the ophthalmoscopic appearances are produced. "It was to the diagnosis of encephalic tumor that Von Graefe first applied the mirror, and he based upon such observations his well-known introductory paper in the seventh volume of his Archives, 1860, on the Complication of Optic Neuritis with Diseases of the Brain." Yet, "I am not able to say, with any thing like certainty, what are the intermediate processes which connect these changes in the head with inflammatory or congestive changes in the disks. . . . On the other hand, if the general question be asked, Is the ophthalmoscope of any use in the diagnosis of tumors? this question must be answered decidedly and emphatically in the affirmative. The situation of the growth has much to do with the appearance of the changes in the disks, and also with the time of

their appearance. But we must be satisfied, if possible, as to the mode of the initiation of the papillary congestion, optic neuritis, or atrophy, which we may discover before we can hope to obtain a knowledge of the processes by which they are established. I had thought that the way was clear to the establishment of the intermediate changes, and in the former parts of this book I have laid down certain inferences concerning their nature which I supposed to be unquestionable. Since those parts were written, however, the attribution of changes in the nutrition of the optic disk to pressure, or to the travelling downward of irritative action, has been seriously disputed. I have not rewritten my earlier chapters, because I still hold the views therein expressed, but the importance of the counter-hypothesis, and the eminence of its supporters, are such, that I take occasion in this place to reconsider the causation of neuritis and atrophy." Who this new hypothesis had for its author seems uncertain, but it was clearly laid down by Benedict in 1868, and adopted by Dr. Hughlings Jackson, and it is, shortly, that symptomatic neuro-retinitis depends upon a morbid innervation of the sympathetic, and this Dr. Allbutt combats at considerable length, resting his argument especially on the ground that genuine neuro-retinitis is rare in cases of uncomplicated tumor, and that the optic change which tumors induce is rather *ischæmia papillæ*. Bearing in mind, however, that it is not always easy to distinguish the one of these conditions from the other, we think that the whole question is not likely to be set at rest by what has already been observed, and that probably it will serve as food for controversy for a considerable period.

Dr. Allbutt's observations on the pathology of cerebritis, abscess, and sclerosis, and on the significance of the ophthalmoscopic appearances, are worthy of serious attention. Differing to a certain extent from the opinion of Drs. Reynolds and Bastian, that there is no such thing as cerebritis, he points out that there is an inflammation of the cerebral mass, but that it is necessarily of the interstitial kind, and, inasmuch as the cerebrum is poor in undifferentiated tissues, the connective element existing in it scantily and obscurely, it is not susceptible to common irritations like the optic nerve or the lung. "In the encephalitis of young children, first discovered by Virchow, the whole encephalon is in a state of 'neuritis,' the proper tissue being crushed out by an enormous and universal hyperplasia of the neuroglia. In the same way an abscess may not be encysted, but may penetrate into the surrounding tissue for a considerable distance, setting up proliferation in the neuroglia and the sheaths of the vessels, with liquefaction

of the nerve-elements, and so optic neuritis may be the result, though observations on the point are much needed." Dr. Allbutt is not aware of any case in which simple choking of the disks (ischæmia) has resulted from the presence of abscess. We turned with interest to the account of general paralysis, concerning the pathology of which writers have differed so widely. "It is a very remarkable fact that in almost all cases of general paralysis there is a tendency to atrophy of the optic nerves. The change seems to be sometimes one of simple atrophy, white from the beginning; in other cases, and perhaps more commonly, the white changes are preceded by a stage of redness, and the whole process then resembles some cases of tobacco-amaurosis, and what I have called chronic neuritis. The degenerative process begins about the end of the first stage, or the beginning of the second, and not infrequently results in complete amaurosis. Probably in most cases of general paralysis great loss of vision might be ascertained in the third stage, if such patients were carefully watched. The pathological characters of the changes in the optic nerves are, a dwindling of the proper nerve-structures, and an overgrowth of the connective tissue. How comes this sclerosis or overgrowth of connective tissue about? Is it that some 'irritation,' say of a 'foreign body,' or of a 'morbid state of the blood,' excites this tissue, which then grows like thistles on stony ground, and chokes the good seed? Or is it that some formative *nîsus* is for some reason, insufficient to raise material up to the height of nerve-tissue, and can create only an inferior product? Or is it, again, that the proper nerve-tissue wastes, ceases somehow to attract and use the blood which passes through the part, and that the connective tissue then fattens upon the blood which it now has to itself?" And so we are still left in doubt, for our author's conclusion is simply this: "The reason of its occurrence in the optic nerves, and in other parts of the nervous system, must in all likelihood be the same, and depends either upon some disposition of the whole nervous system to a peculiar irritation ('reiz'), or upon some state of the blood, such as lithiasis acting upon it as a whole."

After a chapter on the ophthalmoscope in diseases of the spine, in which the author comes to the conclusion that the meningeal and vascular irritation creeps from the spine to the base of the brain, so causing the changes in the eye, we come to a most interesting subject—the retinitis associated with albuminuria. The changes observable in such patients are summed up as follows: "First, we discover a remarkable vascularity of the disk, the old vessels being distended, and a multitude of new ones developed. Besides this, and in intimate genetic relation

with it, we find a considerable increase of connective elements in the same parts, namely, in the disk, and in that district of the nerve-fibre layer which lies more immediately around it.

These changes, together with the coincident infiltration of serous and coagulable fluids, cause the loss of transparency, and conceal the vessels and those edges of the choroid and sclerotic which we call the margin of the disk. As these changes advance, we see the hypertrophy of the connective tissue extending itself up to the lamina cribrosa, sometimes even into the depth of the optic nerve, and making itself manifest likewise in overgrowth of the adventitia of the vessels. This latter interference with the vessels causes emptiness of the arteries, with consequent venous fulness, and causes, moreover, those hæmorrhages which occur first, no doubt, in vessels which are fatty or sclerosed, but also in those which appear to be healthy. As we leave the belt around the disk, we find a proliferation of the granular layers of a much more unstable kind, the instability being due, perhaps, to the diminution of blood-supply. The products, therefore, turn quickly into fat, and form a crown, a crescent, or a constellation of opaque, white prominences surrounding the disk at a certain distance. As time goes on, and the vessels are destroyed, those elements which were formed between the circumvallations and the disk may themselves undergo degenerative change, and the white matter thus gradually invade and include the disk itself.

"In the degeneration of the rods of Müller, in the less vascular region of the macula lutea, we have a peculiar and very interesting example of this kind of instability of connective elements, and of their transformation into fat. Finally, we notice the sclerosis of the nerve-fibres and of the vessels, the latter being distinctly and independently visible in the choroid likewise. How far the sclerosis may be akin to the fatty change, I cannot say: but my own observations have convinced me that the proper hypertrophy and the fatty degeneration of the connective tissue is one process, and their difference is not *in essentia* but *in adjecto*. Herein I must venture to differ from Schweigger and Müller, who conceive, because the two processes take rise in distinct places, and observe each its own district, that they must therefore be distinct in the kind of their genesis."

And then comes the question, What relation do these changes bear to other changes in the organism whose kidneys are diseased? and Dr. Allbutt confesses that, the more he has read and watched the cases, the more difficult is the answer. He believes that "albuminuric retinitis is not essentially connected with the granular kidney, but that the al-

buminuria must be of prolonged duration in order to give rise to it." The nephritis comes first: "All clinical experience assures us that nephritis of some kind, and especially of a chronic kind, is a necessary antecedent." But "I have failed hitherto to find any common characteristics in kidney-patients whose retinas do inflame, and in those whose retinas resist. The immediate cause of the retinitis must be some such common characteristic or condition, but as yet it eludes me, and I am compelled to leave the matter before the reader in this unsatisfactory state."

The next chapter is on leupæmic retinitis, of which the author says that he can give no information of his own knowledge, and this is followed by a couple of pages on the retinitis, associated with syphilis. Here we read that numerous as are the cases of syphilitic neuro-retinitis, Dr. Allbutt seldom or never meets with syphilitic retinitis. In surgical practice, however, it is found, and the characteristic feature is effusion of serum or lymph into the nervous textures of the retina.

There is an interesting chapter upon toxic amaurosis, such as the amaurosis from alcohol-poisoning and tobacco-amaurosis. Nothing very definite, however, is laid down with regard to them. And the concluding chapter is upon embolism of the central artery of the retina and its branches, a subject of great interest to the physician, who here can see one instance of a pathological state which happens in various parts of the system, with its concomitant phenomena, such as loss of function, sudden emptiness of the vessels, œdema of the parts, etc., etc.

The volume concludes with an appendix of cases, amounting to one hundred and twenty-three, and talks of a "long and arduous series of observations made upon the insane," chiefly among those in the West Riding Asylum, under the care of Dr. E. Browne, and in the North and East Riding Asylum, then under the care of Dr. Christie. These serve as useful illustrations of the remarks made in the volume which precedes them, and must be read in conjunction with the latter. We here take leave of Dr. Allbutt, having said thus much in order to draw attention to his most valuable and interesting work, which must be read by all who make the diseases of the brain their study.

Dunglison on the History of Medicine.

THIS book¹ is one of those labors of love, at least in its editorial part, which, judged by internal evidence, is found to agree with all similar productions, in that the relationship of author and editor has made possible the laying of the onus of presentation to the medical public upon the latter, the writer himself having very properly laid aside what he had done.

It is time that such books as this should not be allowed to force further odium upon American medical literature; it is time that medical history, unlike this book, should be something else than a literal copy from what the editor, with refreshing *naïveté*, calls "trust-worthy sources," viz., Friend and Sprengel, and the publication must be considered unfortunate, since it gives countenance to the charge of superficiality, said to characterize American medical literature, and affords encouragement to that gratuitous book-making of which Solomon said "there is no end." We incline to the opinion that, had the distinguished author lived, this work of his younger days would have remained undisturbed.

For many reasons the collection of material relating to the early history of the art is a much easier task than following the comparatively unknown directions taken by medicine in the time subsequent to Galen. It is on this account that Dr. Dunglison has devoted two-thirds of his book to the consideration of the subject during the time anterior to the Arabs, anything more cursory, anything more removed from supplying "the want, long felt by the profession, of a condensed history of the progress of medicine presenting all the main facts in systematic order," than the few pages of paraphrasing, pretending to represent medical history from the sixth to the nineteenth century, being scarcely imaginable.

As an example of that numerous class of medical histories, written by men without any other idea of construction than that of wholesale appropriation from the works of German encyclopedists, Dr. Dunglison's book is an excellent text whereon it is intended to hang a few words on the method of writing a history of medicine of which *Clio* would not be ashamed; and further, the purpose is to discuss the men

¹ Hippocrates and Galen; their Antecedents and Contemporaries. History of Medicine from the Earliest Ages to the Commencement of the Nineteenth Century. By Robley Dunglison, M. D., LL. D., late Professor of the Institutes of Medicine and Medical Jurisprudence in the Jefferson Medical College of Philadelphia, etc., etc. Arranged and edited by Richard J. Dunglison, M. D. Philadelphia: Lindsay & Blakiston, 1872.

and the associations suggested by the name Galen and the name Hippocrates.

Few writers of the above-mentioned class have any idea of the great number of medical men whose task or pleasure has been to give their energies work in the historical literature rather than in the science of medicine. Compilers find all they want in Sprengel, in Friend, in Le Clerc, and the numerous but not-always-exact foot-notes of the former offer a field for choice eclecticism in authorities. Yet, although few names are familiar, the mere list of historians is too long for transcription. Methods of treating the subject are almost as numerous as the names. Andreas Soranus, two of the earliest writers, and Friend, represent the long-condemned biographical method; writers of so great faith in human character that they subordinated philosophies and systems to those who professed the same. Heusinger and Clifton nationalized the history of the healing art, and not so grievous was their error, for, before Roman magistrates were sent to rule the tribute-paying world, national and ethnological were synonymous words. Then there is a German school—not of the before-mentioned encyclopedists—which modelled its work after the curious historico-philosophical conceptions of Schelling and Hegel, but did some good service by introducing the idea of development, although development was often made to consist of unessential modifications of unimportant details. Hecker and Damerow were the chief lights of this school. Kieser, Windischmann, Leupoldt, Quitzmann, Schultze, Friedlander, Auber, started with *a priori* premises, and facts were readily found or methods of verification were discovered to confirm logical deductions.

Barchusen and Broussais looked upon theories and the special systems as the chief phenomena for historical relation. Saucerotte stands almost alone as the able advocate of a history of medicine founded upon the history of its collateral sciences. Haller pursued the plan of eclecticism, which mixed method was adopted by Wise, and dictated Renouard's meritorious treatise.

Meryon wrote a book, interesting enough in its details of English affairs, but the rest of the first volume—the second has never seen the light—disputes the palm of superficiality with Dunglison, and rejoices in a method which human ken will never detect. There is an ugly-looking book by Hamilton, bound in paper boards, but little better than Meryon's production. Hamilton has transcended the limits of ordinary ambition, in disquisitions on the medical knowledge of Adam. Van der Hoeven, Coelicke, and Tourtelle, are also without method. Ackermann, Scuderi, Krueger, Herschel, Morwitz,

and Wuunderlich, have exhibited laudable research, but have done little thinking. Herodotus is not the model for a modern historian, but these authors have copied him, and have strung one fact upon another without association, without any relation but that of contiguity.

- The first authors whose influence extends to the present time, who are of interest to us, because of frequent quotations from their works in modern books, are Shultze and Daniel Le Clerc. There were others contemporary or nearly contemporary with these, but to all except the curious seeker, names other than the two mentioned are unknown, just oblivion veiling anomalies of composition such as Bernier's "*Essais de Médecine*." This work, printed in Paris in 1689, is nothing but a series of sketches of physicians, the subjects having been taken without critical selection, without apparent governing principle. Le Clerc is full of faults, but through no fault of his. Judged by nineteenth-century criticism, his credulity is laughable, and the merest tyro of to-day could vaunt himself as superior in accurate information to that really admirable historian. The bane of criticism has always been this application of the present highly-elaborated rules for judgment to matters of the past—to what was written in blissful unconsciousness of the necessity of squaring itself with requirements undreamed of at the inception of their subject. When estimated fairly, and without this prejudice of time, Le Clerc is found singularly candid and just in his judgments of men and systems, while his modesty disarms hostility to a classification rich in defects. Schultze's "*Historia Medicinal*," etc., Lipsæ, 1728, is made to yield many extracts to subsequent works, but there is distributed through the book too much of a nature similar to that part descriptive of antediluvian medicine. The most celebrated of encyclopedists and of historians of all denominations is Kurt Sprengel. The best-known edition of his work is a French translation by J. L. Jourdan, published at Paris in 1815. Sprengel divides the history into periods, making no apology for using the mythical Argonautic expedition, the Peloponnesian War, and similar irrelevant events, to mark changes in the aspect of medicine. This highly-artificial method is supplemented by partiality for lengthy descriptions of doctrines and sects; matters of equal importance receive little attention; and his vast erudition is so inexact, that would-be partakers of his bounty, such as Dr. Dunglison, often come to grief, being entangled in the thicket of foot-notes. Space forbids more than the mention of many other well-known books, as Ackermann's "*Institutiones Historia Medicinæ*," Norimbergæ, 1792; Scuderi's "*Introduzione alla Storia della Medicina Antica e Moderna*," Napoli, 1794; J. Fr. Hecker's "Ge-

schichte der Heilkunde, nach den Quellen bearbeitet," Berlin, 1822; Leupoldt, "*Allgemeine Geschichte der Heilkunde nach ihrer objectiven und subjectiven Seite,*" Berlin, 1820; Damerow, "*Die Elemente der naechsten Zukunft, der Medizin,*" u. s. w., Berlin, 1828.

He makes a great mistake who contents himself with taking materials from second-hand sources. It is of little difference whether the words of original authorities are copied from the original volumes or from transcribed passages elsewhere; but it affects the interests of truth itself when inferences drawn from these words, at a time when scientific criticism was in its infancy, are made to do duty as the best product of the historical investigation expected of to-day. Thus, from reading what Dr. Dunglison supposes is an account of the early status of medicine in Egypt and Greece, it is easily seen by the old, oft-reiterated relations and by the now almost vulgar error of ascribing a purely sacerdotal character to the art, that the whole is but a weak dilution of the "trustworthy sources" of our author's preface, that the matter has been detailed much more satisfactorily by its original writer, and that, if called on to judge from internal evidence, we should say the book had been written fifty years ago, so free is it from any suggestion of advance in historical knowledge during that period. Although not apparent in Dr. Dunglison's book, there is another error, generally found in company with the idea of medicine as an exclusive possession of priests, which consists in antedating Greek medicine by the art in the East, and ascribing exaggerated influence to the latter. A short discussion on these two points will illustrate the evils of the vicious second-hand method of writing, and what radically different labor is necessary to subserve the interests of truth. In this the admirable "*Histoire des Sciences Médicales,*" by Charles Daremberg, Paris, 1870, will be followed. It must be acknowledged that Daremberg is not an infallible guide. No modern Frenchman is free from tedious diffuseness, and M. Daremberg's condemnation of his predecessors visits every one of them without exception, and too often with prejudice, but wholesome admiration possesses us at sight of investigations in places of last resort, from which are drawn conclusions that serve a better purpose than the traditional stock of fables with the *lucus-a-non-lucendo* name of "History of Early Medicine."

In 1850, Dr. Allan Webb delivered a since-published lecture before the Calcutta Medical College, on "The Historical Relations of Ancient Hindu with Greek Medicine," but his misty fables are not the kind of proof necessary for the establishment of a nice historical point, such as the precise coloring Eastern mysticism imparted to things Greek. Dr.

Wise, in his "Review of the History of Medicine," brought the special qualification of intimate acquaintance with Oriental lore to the discussion; and, although Daremberg avows himself unconvinced by the argument, any one who has no preconceived opinion hostile to the deduction will be pleased to find the *a priori* idea of certain foreign habits of thought, imported into Greece by Pythagoras, confirmed by so good an authority as Dr. Wise. The necessity of hastening to the second part of our subject forbids the reproduction of any extracts from Dr. Wise, but, before passing, too much stress cannot be laid on the unconditional assertion that, whatever our estimation of the extent of this modifying element on Greek medical doctrines, the great part of these doctrines, the part that is our heritage, and that is qualified by the word Hippocratic, is purely, wholly Hellenic—not Hellenic in Mr. Arnold's sense, to serve ourselves with his terms—rather Hebraic in its characteristics than otherwise.

Those who maintain the exclusively religious origin of medicine are blind to the interpretation of many pertinent texts. Homer's doctors, Machaon and Podalirius, were laymen; allusions scattered through "the Iliad" give no countenance to the supposition of a then-existent medico-religious establishment, and such votive tablets as have been discovered were placed in the temples at a comparatively late day. Hesiod, Pindar, the comic and tragic dramatists, speak of an independent medical profession, and it is necessary to consult Aristophanes in order to find evidence of priestly charlatanism. The truth is, that the polity of primitive communities is thought to be discoverable by pure reason; the consequence of which idea is, that very many fanciful conceptions attach themselves to an almost unknowable subject, such as the apportionment of professions in early times, and purely gratuitous suppositions pass current as proved realities. A very favorite idea of this character is the supposed union in one individual of the functions of king, priest, and physician. This was the inspiration of the first writers who seized on all accounts of medical practice in the temples to confirm the *a priori* assertion, and the copyists have been content to perpetuate the error because in modern philosophic literature, tinged with Comte's "Three Stages," or Herbert Spencer's "Law of Evolution," speculations on the early stages of the race were founded upon this venerable perversion of records. In sustaining his estimate of Comte, Mr. Huxley has given some excellent reasons for doubting that universal fetichism and that order of birth of scientific conceptions among our ancestors which the philosopher describes with such engaging simplicity. So of medicine, there is unimpeach-

able authority for believing that, in the earliest period of which there are records, "heterogeneity" was advanced enough to make a distinct class of physicians.

The supposition that the priests of *Æsculapius* were the sole possessors of the healing art in Greece, arose chiefly from the difference in practice between the earlier and the later *Asclepiadæ*. Renouard explains the matter by ascribing the honest, common-sense methods of the one to the purity of the early sacerdotal character, and the bare-faced quackery of the other to the evil influence of such persons as were admitted to the hierarchy by initiation. It is necessary to go no farther than to Plato for light on the cause of this degeneration. Renouard is wrong. When Aristophanes's valet wakened from his sleep, and, expecting to hear the hissing of a sacred serpent, saw the sacristan collecting the gifts from the altars, he witnessed a getting of goods under false pretences, that had been the policy of those priestly reprobates, from the very beginning of their assumption of medical functions. Plato and many of his contemporaries distinguished *Asclepion* physicians—descendants of *Machaon* and *Podalirius*, from *Asclepion* priests; the sons of *Æsculapius* had a father not wholly of divine origin, and Homer makes them human enough; Hippocratic writings exhibit unbounded contempt for those very practices of the temples that M. Gauthier would have us believe inspired every book of the collection, and their recognition of the limit beyond which art is of no avail consorts illy with the idea of an omnipotent god; lastly, is it supposable that such a treatise as that on "Fractures" and "Luxations" could result from such clinical records as the statement of a symptom of the cure recommended, and of the thanks delivered? Before the temples of *Cos*, of *Cnidos*, and of *Rhodes*, were thought of, these same localities were centres of medical practice, and probably of instruction; but it was the honest practice of laymen—priestly mummeries, the deceptions which puzzle the historians to explain, were of later growth.

Though reprehensible in an extended treatise, the biographical method of considering Greek medicine is the most convenient and instructive in a sketch. Hippocrates is a generic name practically if not actually, and, by confining ourselves to it and to its relations, we consider medicine during the magnificent age of Greece, the age of the man of *Cos*, of Plato, and of Socrates.

Historians, animated by the natural desire for personal details of Hippocrates, have delighted to increase the proportions of the slender biographical thread we possess. Others, impressed with the represent-

ative rather than the individual character of the name, have attempted a denial of his existence. In 1804 Boulet presented to the Paris Faculty a thesis with the long Latin title "*Dubitaciones de Hippocratis Vita, Patria, Genealogia, forsân Mythologicis et de quibusdam ejus Libris multo Antiginonibus, quam Vulgo creditur.*" It would have strengthened M. Boulet's case, had he proved Plato a myth before attacking Hippocrates's existence; for they were contemporaries, and the mention of Hippocrates in the "Dialogues"¹ makes all doubts superfluous. The facts of his life are mostly taken from Soranus; but, although the latter is an accepted authority on Methodism, yet the imperfect translation by Cœlius Aurelianus is poor authority for the biography of a man concerning whom that author could have had no reliable information. There are numerous well-known fables, as his pupilage under Herodicus, the celebrated Gynasiarch, who prescribed for his patients the twenty-seven-mile constitutional from Megara to Athens and back; under Gorgias, disciple of Empedocles, and greatest of Sicilian orators and sophists, and under Democritus, the man of atoms himself, upon whom Burton saddled the vagaries of the "Anatomy of Melancholy;" as his diagnosis of the love-sickness of Perdiccas, King of Macedon, and cure by the virgin plaster, sovereign in such cases; as his refusal of the presents of Artaxerxes, the scene immortalized by the painting of Girodet, from which engravings have multiplied to grace the walls of physicians' offices throughout Christendom. These and many similar stories are naught but fancies, such as the human mind loves to weave about its favorites. "I can tell you in two words," says M. Daremberg, "what is positively known touching this great man. He was born about the year 460 B. C., at Cos, where he held a school at the time of the splendor of Athens, in the great age of Pericles."

A word may be said of Dr. Samartides, supposed discoverer of the tomb of Hippocrates. M. Figuier has collected the documents, a reproduction of which would be interesting; but far too much "*d'art grec*" characterizes this attempt for its serious consideration.

There is probably no ancient writer who has done more for modern criticism, and for whom modern criticism has done more, than Hippocrates, by reason of the difficulty attendant on the determination of his genuine works. Doubtless, Galen's admiration for the man would have been less, had he known how many excellent treatises the future would exclude from the works of the man whose name they bear. Nor is this iconoclasm wholly chargeable to modern investiga-

¹ Protagoras.

tion. The revival of letters incited a host of scholars to devote their life-times to the preparation of editions of Hippocrates, and this labor was under auspices so different from the credulity of early editing, that Hippocrates's name was struck from one treatise after another, until Mercuriali crowned the work commenced by Leonicens and Thomas Linacre, by compressing the genuine works of Hippocrates to fourteen treatises. M. Littré, the great master of this Hippocratic criticism, is recognized everywhere as the best authority of to-day, although in some minor points the edition of Dr. Francis Adams, published by the Sydenham Society, is superior. M. Daremberg, who compels respectful attention by his graceful acknowledgment of M. Littré's preëminent scholarship, reduces the number of treatises, to which no possible doubt of authenticity can attach, to two—that on "Fractures," and that on "Dislocations." There is no question but that the contemporary evidence of Ctesias, and the evidence of Diocles, who lived but a few years later, is as strong proof in favor of these two treatises as that enjoyed by any book whatever; but we cannot think that M. Daremberg has been happy in his implied attempt to discredit the conclusions of the great critic Littré. Contemporary proof is the strongest sort of proof, but surely there are other varieties capable of leading to equally sure conclusions.

The importance of the writings of Hippocrates, and those of certain members of the schools of Cos and Cnidos, is beyond accurate estimation. Greece was Hippocratic, Rome was Hippocratic; Galen wrote modified Hippocratism, the Arabs followed Hippocrates through his interpreter, and mediæval medicine meditated upon him through the medium of his earliest commentator; the first tentatives of reformation were undertaken in his name, and even during the present century his doctrines might be found in some text-books.

These writings are very accessible, and any analysis of them is out of place here. It is enough to say that they inculcate a spirit of fair and open dealing with patients, and express such high estimate of the art's dignity, that one who reads without prejudice will never be persuaded he is communing with the utterances of a thieving priest. Further, Hippocrates delivered medicine from a self-sufficient philosophy—a philosophy that negated all scientific advance by divorcing itself from experience, and then from the heights of reason were imposed laws upon all phenomena. Although the Hippocratic displacement of philosophic by medical suppositions was small gain in matter of fact, it was a patent im-

provement of method which showed itself in such mono-dialogues as that on the cure of the effects of a bad diet, by heat, cold, or humidity, in the treatise on "Ancient Medicine." This is a remarkable passage, with the remarkable conclusion that good diet only, and not the heat, coldness, or humidity of articles, is worthy of note in curing the effects of bad diet. The books on fractures and luxations would make excellent text-books for the student of to-day. Indulgence is asked for an illustration of the late date at which Hippocrates was still an authority on these subjects. Since 1814, when Colles published his well-known article in the *Edinburgh Medical and Surgical Journal* on the fracture of the radius that bears his name, everybody knows that dislocations at the wrist-joint are of extremely rare occurrence. Before Colles's time, and before Pouteau, who in 1784 somewhat anticipated Colles, these dislocations were thought very common, and the four displacements of Hippocrates, inward and outward, by which he means displacements to the palmar or dorsal surface of the hand, and to either side, were accepted on his authority by surgeons everywhere. Hippocrates had said that the inward displacement was the most frequent. By the context it is seen that he looked on the hand as the dislocated part, so that, what he rightly called the most frequent displacement would be a movement of the bones of the wrist, such as to bring them on the palmar surface of the bones of the forearm, the condition being marked by strong extension of the fingers. Now, in translating this passage, Celsus mistook Hippocrates, in imagining that the forearm and not the hand was the dislocated part, ascribing the clearly ridiculous symptom of extension of the fingers to the displacement in which the bones of the wrist rest on the dorsal surface of the bones of the forearm. Hence, writers of this century, in following Hippocrates through Celsus, have been content to perpetuate a patent absurdity because of its supposed authorship. Had they gone behind Celsus, the sage by his truthful description might have shamed them out of such slavish doctrinal adhesion.

In the prognosis and symptoms of acute diseases, the teachings of these writings have always excited the enthusiasm of critics. Anatomy is far from showing advancement worthy of its associations, and physiology is wholly abandoned to the imagination. The skeleton, indeed, was thoroughly studied, but Democritus, probably the best authority on structure of the time, was a poor teacher, whose knowledge was meagre, although Cuvier says he

was as good an anatomist as an atomist. The assertion that at Hippocrates's visit the laughing philosopher was found dissecting animals, may be taken for what it is worth.

Though brought up in the very battle-field of rival philosophies, Hippocrates chose a course opposed to their very spirit, and his glory is the greater because his professed followers and successors tried to serve two masters, and taking their cue from all systems, commencing at Stoicism and ending with Epicureanism, built up systems of physic to match their professions. The balance of Hippocrates's mind is seen in that a crude pathology was never suffered to warp his judgment. Surely there never was a better opportunity for an idea to become too much for a man, than that involved in deducing conclusions from his etiology. A common cause for all disorders did not seduce his imagination into recognizing a common course for the same. He rose superior to logic, and so justified the little-understood eulogy of Celsus: "Hippocrates was the first who separated medicine from philosophy." It is beyond doubt that Pythagoras appeared in that part of these books which, because it is of a nature foreign to their positive character, is the part of least subsequent influence. Although of a mystic spirit, this influence cannot be considered injurious. It was at this time that competition began to make success in treatment the measure of success; that faith in oracles commenced to decline, because men found an ingenious play on words scarcely a satisfactory rule for conduct; that Aristophanes sharpened his satirical pen against the priest-physicians themselves. But of all influences calculated to bring the human mind, a mind hitherto at leisure, to amuse itself with its own conceptions and relieved of sordid cares, delighting to rear imaginary altars to unknown gods, or rejoicing in the search after some new thing, within the sphere of phenomena moved no more by mythological machinery but acknowledging natural causes, the most potent was the school of Crotona. The moral courage which adopted a doctrine so foreign to Greek habits of thought as the metempsychosis of the Bramins, did not hesitate to say disagreeable things of the corrupt system of the Asclepiadæ. In addition, the claim of originality for their system, maintained by the priests, was disproved. Greece was a clear copy from Egypt in matters mythological. A god could be transferred from one country to the other with far less violence to the representative conception than happened in the subsequent forced correspondence instituted between Greek and Roman

mythologies. Pythagoras, with an intimate knowledge of the objects of Egyptian worship, was not slow to recognize how exactly the admixture of theology and medicine in his own country had been copied from an identical arrangement in the land where he had spent twenty-five years of his life. Nevertheless, in both nations, this was no system dignified by age, but rather the offspring of late corruption. The patient and long-suffering Pythagoras would have felt amply compensated had he known that, incorporated in the works of authors, his speculations on the relation of the microcosm to the macrocosm, of man to the universe, would descend to posterity. The Hippocratic physiology maintained that fire, air, earth, and water, the elements of all things in the macrocosm, had their analogues in the microcosm. Blood, bile, and pituita, were three of these analogues, but the fourth was undetermined. Some called it *atrabile*, to which the qualities of earth were supposed to belong; others believed it to be the water of the body. All this was Pythagorean.

In these desultory remarks the desire has been to call attention to a few results of modern research specially bearing upon the general character of developed Greek medicine. The history of the laborious work of Greek commentators, and the accurate results of the investigation, may be found in the editions of M. Littré and of Dr. Adams. It remains to say a word upon the differences in doctrine between the contemporary and rival schools of Cos and Cnidos.

Cos was philosophic, not in the sense of Grecian hair-splitting, but in its anxiety to give a reason for its doctrines, even though that reason be the negation of its own axioms. Cos discriminated nicely between different diseases, even when certain common symptoms greatly obscured the distinction: Cnidos called every collection of symptoms a distinct disease, and, without a single pathological idea, invented impossible distinctions between the various diseases of each organ itself. Thus, there were twelve varieties of bladder-derangements, three different kinds of tetanus, four sorts of kidney-disease, etc., etc. Cos has the credit of excellent clinical observation, but Cnidos possessed some knowledge of physical diagnosis—a fact little known—but which is proved by the mention of a *bruit de frottement* in pleurisy; and reference to certain signs of other thoracic diseases. It is a great mistake to imagine that the gymnasium was the exclusive conservatory of the surgery of the time. So far from that institu-

tion being a school for surgeons, the evidence favors the idea of a usurpation of the privileges of the regular practitioner by the gymnasiarch. Truly a surgery of the schools in question was not contemptible that gave directions for incising a kidney in which suppuration had occurred at the site of a calculus, for thoracentesis in empyæma, for opening a post-pharyngeal abscess, for trepanning in certain conditions of the skull or brain, for ablation of polypi, etc. Lastly, Cos was heroic in its use of bleeding and drastics, a practice in accord with Hippocrates's idea of a physician as a man of art—not a mere attendant upon Nature, who goes in the wrong way as often as in the right. Cnidos believed less in the power of such remedies, and made the rivalry between the schools apparent, in substituting for such simple but powerful agents, which it did not love, the accumulated action of a large number of less potent remedies.

Sprengel writes: "The dogmatic school of Plato is chiefly chargeable with undoing all that Hippocrates had done, and because all the chiefs of the school dogmatic introduced more or less of the physics of Plato into medicine." The qualification "chiefly" is well introduced here, for, in the long stretch of five hundred years between Hippocrates and Galen, many were the schools to which the reproach of the German historian may be addressed. The method which these schools introduced, Galen replaced, by a minute observation of symptoms. This and another trite statement, that before him was nothing but vanity of speculation, and immediately after him nothing but the weakness of the Byzantine school, and we are ready for the antecedents of this great reformer in physic.

Mr. Grote, in his criticism on that wonderful dialogue in which Plato exhibits Socrates awaiting death, has admirably explained the religion of the dogmatists which Sprengel justly says is chargeable with undoing the whole of Hippocrates's work. Profound identification with the application of the pure essence of thought in their search after the pure essence of the thing, made the dogmatists look upon vulgar interpreters such as the eye and ear as instruments which served but to impede the soul. Astronomy was thought to illustrate the utter importance of the senses, while the conclusions of reason, when verified by the same authority, of course enjoyed a grand degree of certainty.

To do more than allude to the evil influence to which medicine was exposed by such outrageous and yet engaging doctrines

is mere waste of space; so, passing to influences more potent and more productive of good, Aristotle demands attention, because many of Galen's doctrines were corollaries from the deductions of the Stagirite. It may be remarked, that Aristotle's mind was more inquiring and in a certain sense more subtle than Plato's. Plato was content with the doctrine of final causes, in which he was copied by Galen, but to Aristotle the use of a thing was the least explanation of its being; he invented material, formal, and efficient causes besides accepting the final. Plato stumbled on the law of association in memory, but the less obvious and more difficult-of-appreciation law of contiguity was given by Aristotle. Further, as has been shown by that first of critics, Mr. Grote, Aristotle discovered great contradiction in the idea of a soul's having a fixed, bodily location. To expect him to give up the idea of the material soul of Greek philosophy is too much, but he never embraced the conception of the soul's composition of separate corporeal elements, the idea of Democritus and Empedocles. Physiology, so hopelessly befogged by Pathagorean mysticism, Aristotle invested with the terms of to-day, and brought it within the domain of his analytic method. Four primitive qualities composed the soul: vegetative, sensitive, motor, and intellectual. This last Aristotle seated in the heart, a most outrageous assumption, for which he is wholly accountable. Some critics have concluded from this that the ancients universally regarded the heart as the seat of the intellect, but apart from the absurdity of imagining any belief other than the general and almost intuitive association of the brain with the mind, the fact that this conception was merely one of the vagaries of the Stagirite, is proved by numerous such conceits as that of which the function of gestation ascribed to Jupiter's brain in the special interest of Minerva is an example. Anatomy is under obligation to the observations of Aristotle on the lower animals. For this end, his pupil Alexander the Great found time, in the business of conquering the world, to carry on a correspondence with his master, informing the latter of consignments of such animals as the husbandmen and bird-catchers could capture. It is in such concrete matters that the advanced ideas of Aristotle are most apparent. He indulged in none of the speculations of the humoral pathologists. With him the blood was the life of the animal, and disorders of that fluid a more appreciable cause of disease than the irregularities of the vital spirit.

Theophrastus was more faithful to his trust of the legacy of his master's teachings than any successor of Hippocrates. It is said that Aristotle designated the Lesbian as his successor by the device of pronouncing the wine of Lesbos the best of the many specimens, among which was that of Rhodes, presented at his request. He was called Theophrastus by his master because his eloquence was such as a god might envy, but this natural gift was nothing to the acquirements of the man. The number of treatises on widely-different subjects, attributed to Theophrastus, is something enormous, but what concerns us is that he was the first who attempted a classification of plants. Five hundred species were recognized by him, the paucity of the number being the consequence of confining his observations to the narrow limits of Greece. The merit of the classification consists, not so much in its nature, as in the simple fact of its being a classification attempted at a time when phenomena were regarded as isolated facts. His work on the "Causes of Vegetation" is still more remarkable. Six books of this are extant, and contain a statement of the sexual organization of plants and the elaboration of juices in the root which is as true as it is possible such a subject can be without the microscope.

From the peripatetics to the Ptolemics seems an almost natural transition. The glory of Greece had long been declining, for her greatest statesmen, orators, and warriors, had already found their place in history, and the arts no longer found a stable seat in their native peninsula. Alexander's death precipitated a new order of things. Heterogeneous nationalities, with no other binding tie than the ambition of a conqueror, fell apart when the tie was severed. In the subsequent division of the great empire, Ptolemy Soter was awarded Egypt. The lieutenant and confidant of a general singularly happy in his selection of officers, Ptolemy conceived a plan worthy of his familiarity with great things. The seat of government was located in the beautiful city founded by and named after Alexander, and, in the organization of his capital, Ptolemy was governed by a spirit that had grown large and catholic by triumphant and extensive travel. Imbued with Alexander's spirit, Ptolemy scrupled at no means to gain his end. Thus, after the time of Nehemiah, Judea was joined to the satrapy of Syria, and the unfortunate country now lay a debatable land between Syria and Egypt. Ptolemy knew the Jews as an industrious people; so on a Sabbath-day, which the theocracy would

not break, even to defend itself against assault, he stormed Jerusalem, and carried a hundred thousand workers with him to Alexandria. Although an objectionable method of populating, this wholesale kidnapping resulted in much good to both parties, and the world owes the Septuagint to learned Jews of Alexandria, laboring under the auspices of Philadelphus. To detail the history of the erection of beautiful and useful architectural monuments would be an interesting task, but, while these have crumbled to dust, the works of literature and science will never pass away. No excuse is necessary for brief allusion to the general status of these subjects, since it is necessary for understanding that with which we are specially concerned.

The greatest glory of the museum pertained to that early period before dialectics had supplanted science. Whoever takes up the works of M. Barthélemy Saint-Hilaire, or M. Jules Simon, will fail to appreciate this fact, for these disciples of M. Cousin are naturally more in sympathy with the metaphysical epoch of Alexandria, when Hipparchus and Euclid had passed away, and when Galen found there nothing worthy of his attention except anatomy.

Pharos was connected with the main-land by a mile-long break-water, and in the safe harbor thus secured rode a multitude of the ships of the neighboring provinces. Fronting this harbor was the museum. A great court was enclosed for a general meeting-place, and here gathered daily all the men of learning that the bounty of Ptolemy had attracted to Alexandria. Here intruded no sordid care of existence. A common table was provided, and that leisure, which Hippocrates had so insisted upon as a necessity for the student of medicine, was enjoyed by the votaries of all professions. The Greek element predominated in both the number and influence of its representatives. That frequently successful statesman and scholarly disciple of Theophrastus, Demetrius, having been condemned to death, because of his connection with a popular tumult, escaped to Alexandria, and in his coming gave the signal for a general exodus. Poets, mathematicians, and philosophers, joyfully embraced an asylum where quiet reigned instead of tumult, and the changing favor of the populace was replaced by the sympathy of an absolute king. Here the exact sciences commenced a development such as could result from the happy conditions surrounding. A physical collection was in process of formation under directions sent by Theophrastus; mathematics was

much advanced by Timocharis and Philostephanus—geometry reaching perfection through the labors of Euclid; and astronomy claimed an Aristarchus, who knew the Chaldean method of predicting eclipses, while Copernicus was anticipated, in his demonstration of the fixity of the sun, and the motion of the earth, by this same interpreter of the heavens. But genius could not be created, even by Ptolemy. Alexandrians, ashamed to appear naked in public, would have been called barbarians by the Greeks of an earlier age, and an order of things, that looked upon the firmly-knit muscles of an Olympian victor as more sightly than any drapery, having passed away, a Phidias could not be born where there were no models. At best, the city of the Ptolemies was of mixed population, and poetry hitherto had been intensely national. So, what could be expected of bards compelled to sing the songs of their country in a strange land? True, Theocritus and Callimachus are not forgotten, but the world was too old for a Homer, and epics of a later period could sound the praises of none except the king.

Medicine was worthy of so great associations: Herophilus of Carthage, subsequently of Alexandria, is its best-known representative. Worthy pupil of so great a master as Praxagoras, the celebrated physician of Cos, Herophilus was an enthusiast in the advocacy of his teacher's doctrines, a dissector of human subjects, and the founder of a school which has become historical. Praxagoras is reported by some historians to have distinguished the arteries from the veins, blood-vessels having been confounded under the common title of *φλεβες*, previously. Galen's rather indifferent estimate of Praxagoras was probably caused by his blindness to the blood-carrying function of the arteries after abolishing the confusion of the vessels. Indeed, Praxagoras must have been very blind, for he was accustomed to explain the bleeding of an artery, on its being wounded, by supposing an unnatural state in which the arteries no longer carried air, but solicited blood from all parts of the system. Probably, Praxagoras is further chargeable with instilling certain fierce notions into the mind of his pupil; for Tertullian accuses both Herophilus and Erasistratus with the dissection of living men. C. Aurelianus says Praxagoras removed impacted *fæces* by laying open the abdomen. Such a practice might have predisposed Herophilus to human vivisection, but the truth of the charge is an open question. It is very possible that a man like Tertullian, converted from bitter

enmity to eloquent defence of the Christian Church, solely by watching the cruel sufferings of the saints, would be apt to impute the infliction of torture to a heathen, even if the subjects were not Christian martyrs. Be that as it may, it would be a kindness to extend that sort of charity to Herophilus which Macaulay employed so successfully in his rescue of Machiavelli's "Prince" from contumely. Simply this: it was not looked upon as inhuman to open a living man, in times when it was thought a laudable sport to pit such captives, as were unfortunate enough to have large muscles, against their fellows or wild beasts, for a fight to the death in the arena. If these things were so, if the times make their own morality, there is abundant excuse for an enthusiast who studied the processes of life upon a condemned felon.

The great fact in the labors of Herophilus is thus stated by Galen: He learned anatomy, "not from dissections of beasts alone, as physicians generally do, but principally from that of man." His is the first of those great names, which we honor daily in our nomenclature—the *torcula Herophili*, the great whirlpool of the sinuses, being named from him. The nervous system was chiefly elucidated by his researches. He saw and described the *calamus scriptorius* in the floor of the fourth ventricle, and arranged the nerves into three classes, one class coming from the cerebrum, another from the cerebellum, and a third from the cord. This was an immense, a wonderful advance from the anatomy that assigned an origin for all the nerves in the heart.

Erasistratus widely differed from his great rival, because he drew inspiration from Theophrastus, with whom Praxagoras had little in common. Erasistratus in certain ideas of treatment was more in harmony with the Cnidian tendencies of Alexandria than Herophilus. He, too, was the head of a school, but its dogmas had none of the Herophilean certainty, almost Hippocratic in its reliance on the physician's art. Erasistratus rather held medicine to be a conjectural art, the practice of which was any thing but axiomatic. Erasistratus, who first recognized a sensory and motor division of nerves, did that without which it is difficult to believe Galen could have made deductions from his physiological experimentation, and the conception augurs an advance in nervous physiology equal to that effected by Herophilus in anatomy.

Hippocrates was no such power at Alexandria as he had been in Greece, and was destined to be in Europe. Such as adhered to his dicta now called themselves or were called dogmatists, and

the school possessed no more if as much importance as that which belonged to the two great men of whom we have spoken. That superstitious reverence which till lately possessed, and even now possesses all who made mention of "the grand old man of Cos," a feeling that discouraged and replaced all attempts at giving prominence to what was of real value in the Hippocratic treatises, by vain panegyric on a figure which, as ordinarily conceived, never had a real existence, was there a thing unknown. This diversity of opinion acted as healthful stimulus in the early days of the school, but at the end its effect was of the baleful character we have deplored. Before degeneration there was ample time for such progress as has been sketched. There were other improvements in medical doctrines, which it is impossible to credit to any particular man or school—which seemed the general result of the many special influences at work, for the good physiology claims a very important accession from this common stock. There was not the faintest inkling of a chemical idea in the entire circuit of the schools. Chemical actions, though concerned with things of sense, were too intangible for the grasp even of speculators upon the pure essence of things, and so, although conceptions of any action but that of immediate contact were unthinkable by the philosophers, yet when anatomy had destroyed the supposed air-canals of Empedocles, Democritus, and Diogenes, physiology advanced to the supposed function of the arteries, as air-carriers immediately *en rapport* with the bronchi.

This was erroneous and opposed to the anatomy of Herophilus, but any thing was an improvement on the cumbersome metaphysical machinery hitherto invoked for the explanation of respiration.

Celsus has divided the medical art of the period into three divisions, called dietetic, pharmaceutical, and surgical, respectively. This has met with all sorts of interpretation, but late criticism inclines to the view that the division was for the memory, just as any subject is arranged for the sake of classification or to facilitate reference. There were, as a matter of course, surgical specialists, originally general practitioners who had developed extraordinary ability for such practice; but to class physicians' cooks, mere pharmacists, in the professional ranks, was never intended by Celsus, and the fact that Sprengel interpreted him literally in this instance only proves the unreliability of this historian in matters of inference as well as in matters of fact. Many physicians were their own apothecaries—Galen prepared the *heriaque*

admirably. The *rhizotomes*, another variety of medicine-men, were gatherers of plants, the *pharmacopoles* buying the raw material of them, and selling the preparations from the roots and leaves. The fact that this traffic was carried on in the apothecary-shops kept by the pharmacopoles proves that medicine was as much separated from pharmacy then as it is in the large cities of the United States to-day.

The school of Rome possesses great historical importance as the scene of the first effects of Galen's reform. Asclepiions had been established in Italy at the same time as the medical art was usurped by the priests in Greece, but, when these institutions lost favor in their chief seat, a similar fate attended their imitations. It may not be uninteresting to say a few words of a great Roman physician, who proved that there was at least one exception to that servile imitation of Greek institutions affected by Italian degeneracy. Asclepiades, of Bythinia, had been an Alexandrian physician, but was attracted to Rome by the prospect of obtaining the citizenship which Cæsar conferred on all physicians. It was by deliberate reasoning that Asclepiades became convinced of the evil, frequently greater than the malady, which resulted from the repeated administration of nauseous drugs. People were attracted by a practice which promised health as the reward of moderate frictions of the skin, together with the internal use of wine, and soon the physician acquired a handsome fortune. The sneers of Galen have caused the merits of Asclepiades to be underrated, but the treatment introduced could boast of a far more rational basis than that of the great man—his detractor.

At that time the natural history of disease was unwritten, and patients with an acute inflammation were treated by those frightful punishments attendant on the possession of a fairly good pulse, a treatment from which we of to-day have been so lately delivered—bleeding and purging, when a let-alone policy would have seen the disease terminate so happily of itself. Hence, the simple announcement of Asclepiades, that the best remedy for a fever is the fever itself, is beyond all praise. Well would it have been had there been more Asclepiadeses. We should then ever have been free from ideas of "*materies morbi*" to be bled and purged out of a man. Morbid phenomena are but a modification of normal processes, and their products but a modification of the normal products of normal tissues. The foul, sloughy mass that we call an epithelial cancer is not distinguishable microscopically from

the normal epithelial cells that line a mucous membrane; the effusion in acute arachnitis, which kills by its pressure on the great nervous centre, partakes of the character of that bland reparative material which binds together the cut surfaces of a wound. Forty years ago, the preparation thought necessary before commencing a quinine course for the ague was often a preparation for death. The yellow, cadaverous, shaking inhabitant of an ague district was made more bloodless by draining him of his life-fluid, and disturbing digestion with drastics. And all for what? Because the physician had in his mind a conception, as much an entity, a personality, as the ancient vital spirit, which he called "*materies morbi*"—a demon which was to be expelled, though the process rent the patient sore—nay, perhaps, killed him. Forty years ago, cholera, to the man of knowledge, was a disease in which Nature was doing the right thing by one channel, and he sadly failed of his duty who did not assist her by the other. Forty years ago, scarlet fever was one of those "sthenic" diseases in which the rank offence of having a fair amount of bodily vitality, with which to withstand debility, had to be expiated by full depletion. Forty years ago, from the poor wretch, whose insufficient food and evil surroundings had invited a frightful erysipelas, nothing was made of taking a pound or two of the impoverished blood, and the more frequent and fluttering became the pulse under this murdering process, the more persistently was the indication (?) followed! But now the doctors have come to believe that the patient is of more importance than the disease; that heads stuffed full of etiologies and nomenclatures, for the management of a peritonitis or a pleurisy, are well exchanged for the judgment of a man sympathetically and scientifically prepared to succor the helpless by reason of infirmity, and to assuage the pain of a human being to whom bodily harm has come. Eyes were opened when it was seen that inflammations, which were often cured by remedies directed against the "phlogiston," passed away and left no trace, even more frequently when no treatment was used; and some dared to ask themselves if those who died, had not succumbed to well-intended but injudicious measures, rather than to the disease. Then followed conviction that the doing evil that good might come was as bad in physic as in morals, and further that the fetich of an exaggeration of nutrition in disease was accountable for a use of evacuants of which death was often a *post* and *propter hoc*. Had there been more Asclepiadeses—more men impressed

with the importance of therapeutics, rather than of doctrines, there would be less error to regret.

It is hoped that the comparison of the treatment of the Roman physician with that of to-day is sufficient excuse for the digression into which we have been drawn almost involuntarily. Cassius, a physician highly eulogized by Celsus, used a treatment of a nature allied to that of Asclepiades. He overcame the insomnia of drunkenness by plentiful draughts of cold water to dilute the wine and stimulate the kidneys. One of his medical problems evidences a minute acquaintance with anatomy. In answer to the question why an injury to one side of the head causes paralysis on the opposite side of the body, he replies that the nerves derive their origin from the base of the brain, at which point those of the two sides decussate. This question is generally supposed to owe its solution to the physiological experiments of Galen. Meges was a surgeon of eminence, who in his pathology of abscesses foreshadowed a discovery of much later date; for he demonstrated that pus always formed its own lodging-place, the old opinion having been that collections of matter were always invested by a nervous sheath. But greatest of all was the most elegant gentleman and first surgical author of his age—Cornelius Celsus. The elegant Latin of the "Treatise on Medicine" was a fit setting for the precious matter therein contained. "When there is no certain knowledge of a thing," writes Celsus, "a mere opinion about it cannot discover a sure remedy, and it must be owned that nothing is of greater use, even in the rational method of curing disease, than experience." Such principles owed little to the endless disputations of philosophers, but rather breathe the spirit of Celsus's favorite masters, Hippocrates and Asclepiades. Celsus's logic is no respecter of persons. Chiefly did he sift the pretensions of the methodists—a sect now beginning to appropriate medicine. "If their maxims," said he, "are universal and hold in every place, then are they greater rationalists than the rationalists themselves; but, if they do not maintain this universality, then certainly they employ experience, and ally themselves with the empirics." The accurate knowledge of ancient surgical instruments we possess, comes from Celsus's book, and the very excellence of the account of them and of their use—the latter including almost all the operations practised by moderns—has been the cause of that partiality which historians exhibit for taking their estimates of ancient surgery from Celsus, although the same

writers go back to Greece for the materials relating to the purely medical part of the art. The pathology of abdominal accumulations was greatly cleared up by the Roman surgeon—anasarca, tympanites, and ascites, being distinguished from each other, while the operation now in use was recommended for the latter condition. He gave excellent directions for the operation to relieve strangulated hernia, and described the operations for stone. Especially admirable is his treatment of wounds. Various, complicated, and expensive were the popular plasters and unguents, while he contented himself with evaporating lotions in simple wounds, and recommended excision for poisoned.

As already seen, Celsus is one of the authorities from whom our knowledge of ancient methodism is gathered. His judgment about this sect is even more reliable than that of either Galen or Soranus; thus the important methodistic doctrine, framed by Themison—that different supposed conditions of evacuation, states in which the body is losing too much or too little, or is in an intermediate condition, furnish the simple indications of treatment—is recorded by Celsus. Methodism pretended to hold a middle course between dogmatism and empiricism; on the one hand it taught that the search after occult causes had been the occasion of endless disputes, without enriching medicine with aught but vain speculations, while its opposition to empiricism was a born hostility to supposed blindness to obvious deductions. Celsus had sufficient discrimination to detect the stultification of these self-sufficient doctrines in their favorite evacuation-theory; but, although his criticism was very sharp and convincing, it had little effect on his contemporaries. Methodism could not long retain its original state. The firm lines of belief and exact limitation of ideas affirmed of these philosophies by some learned moderns are lamentably far from the truth. It will not do to expect hypothetical consistency with, and rigid adherence to, every wind of doctrine affirmed of any sect by different writers, on the part of professors of any philosophical creed. Hence methodism gladly hastened to modify its dicta, when the application of a little logic proved how untenable were certain articles of faith. Excessive perspiration and excessive expectoration are both instances of excessive evacuation, but surely the little which the two conditions have in common would never furnish a therapeutic suggestion. M. des Étang, in his praiseworthy translation of Celsus, views the author of his subject in a very ingenious way, to which

we are inclined to agree. It is pretty generally agreed, from internal and evidence of other nature, that the great Roman was not a professional man in the strict sense of that term. With this negative idea few have been content, for the reason that it was scarcely supposable an amateur could exhibit such an intimate acquaintance with the technicalities of the art. Cato was the representative of a medical man of Rome, before the time that that city possessed regularly-trained physicians. Now, the idea of M. des Étang is that, in the later days of Rome, there were rich men with large establishments who still retained affection for the ancient system, by which each householder prepared himself to attend to the medical necessities of his retainers, or else trusted that function to some intelligent slave, and that Celsus was one of these proprietors. Very different was the enlightened practice of Celsus to that of his prototype Cato. That severely and rather unpleasantly virtuous old Roman, with his narrow-minded prejudice against every thing Greek, stupidly maintained that physicians delighted in the death of their patients, not thinking how, in this wretched charge, he reversed the ordinary self-interest which is the *animus* of the motives of all men.

Galen owed to Pliny the Elder many of those references to natural history found in no particular treatise, but scattered through the physician's writings. So, in this attempt at a consideration of Galen's antecedents, a brief reference to the great encyclopedist becomes necessary. Pliny was born during the first century of our era. The extraordinary application of this man, a matter on which his nephew so glowingly commented, made him the most learned man of antiquity, and that, although throughout his lifetime he was a faithful servant of the state. He occupied in his own country much the same position that Aristotle did in Greece, but with this important difference: Aristotle was from necessity an observer, while the multitude of books of a late period made Pliny chiefly a compiler. Two thousand authors made involuntary contributions to the "Natural History," and a passion for the introduction of any thing that anybody had ever written or said concerning any topic led Pliny to the most absurd conclusions. Let it not be understood that fondness for books was incompatible with an eagerness for observation. The early morning of each day was devoted to instructive conferences between the master and a pupil who was the Emperor Vespasian himself. The firm friendship of these illustrious men, cemented

by such strong ties, made them companions on many military expeditions, which gave Pliny opportunity for the elaboration of such subjects of his work as required extended observations.

In the "Natural History," six books were devoted to the medical uses of plants, the whole number of books given to the general subject of the vegetable world being but ten. As a medical topographer, Pliny has abilities worthy of general recognition, his description of the plague or *mentagra* at Rome ranking next to the chapters on the similar visitation of Athens by which Thucydides is immortalized. There is no justification for further delay on this great *savant*; and with the remark that Pliny, by his many superstitious stories, and readiness to record whatever trenched on the marvellous, especially in matters medical, represented the lax or popular physic of the time, we pass to a name of frequent occurrence even in modern *materia-medica* treatises. This is Dioscorides, of Anazarba, in Asia Minor, a self-made man, whose grammar is not at all times grammatical. The wandering life of surgeon to a Roman legion gave Dioscorides opportunity to lay Italy, Egypt, France, and Spain, under contribution for his favorite labor of collecting and describing medicinal herbs. Many works on this essential part of medicine had appeared before the treatise of this enthusiast, but his was the sole authority that did not give that license to imagination which made reference useless for reliability. Especially did Dioscorides shine by comparison with the great Pliny. The general distaste for scientific studies, at Rome, for which Cicero was chiefly accountable, rendered it necessary for Pliny to appeal to the faculty of wonder if he would secure the success of his work. In addition, Pliny's treatise contained matter of interest to every profession, be it that of the physician, cook, or agriculturist, and these practical hints were the means with which Pliny gilded the nauseous scientific pill. Dioscorides truckled not at all to such readers. His judgment is at fault only when opportunity for observation is wanting, and with his direct proceeding to the matter in hand, unrelieved by the introduction of any ornament of style, he nearly resembles a certain class of modern specialists. As has been noted, the work of Dioscorides was essentially a *materia medica*, and the shortcomings in this respect of other authors on plants, of Bythenus Heraclides, Crateras, Andreas, Tylæus, Petronius Niger, and of Diodotus, was one of the excuses for its appearance. In fact, no idea was more foreign to Dioscorides than that of writing a treatise on botany; for, if a

plant had no medicinal virtues he did not mention it, and often his descriptions of physical characters are imperfect and hurried, in order that greater space might remain for what concerns therapeutical applications. Of the influence of Dioscorides it is sufficient to remark that, as, during the middle ages, it was not the disease that was studied, but rather whether the disturbance of function was described in Galen, so existence was denied to hitherto-un-discovered plants unless their characteristics were found in Dioscorides. This was virtually maintaining that the obscure surgeon had seen the plants of the whole world. It was supposable that certain shrubs might be found which had escaped discovery for centuries after Dioscorides, but that the great authority could have been ignorant of such hidden existences was an unthinkable thing.

Claudius Galenus was not troubled with that modesty which forbids one to write of his own life and deeds; the biographer's task being simply to collate from the works of the great physician himself those details of the man and his contemporaries which interest us so greatly. Because Galen is so thoroughly a man, so amenable to the frailties of universal human nature, because he is so free from the god-like qualities with which modern enthusiasts would inevitably have invested him, had not he himself defeated all such attempts, do we never tire of reading one who, though separated from our time by so great a lapse of years, was a man of like passions to our own. Galen was born A. D. 131, of parents whose intercourse may be likened to that of Socrates and Xantippe. Indeed, the learned and amiable architect Nico named his son from *παλα*, because, we may suppose, he desired at least the suggestion of those soothing qualities typified in the mild and gentle laxative of the pharmacopœia, which were so sadly wanting in the household at Pergamus.

Pergamus was worthy of the great physician. Princes reigned there whose generous policy rivalled that of the Ptolemies. Here, before the days of Attalus, an immense library had been collected, of which the city was subsequently despoiled by Roman ambition; for Marc Antony valued the books as a present to Cleopatra, and they were never sent back from Egypt. The rivalry between Pergamus and Alexandria became so great at one time, that King Eumenes was obliged to introduce the use of the dried skins of animals among his copyists, the exportation of papyrus having been forbidden by Ptolemy Euergetes.

Under the reign of Attalus II., the celebrated preparation known as *theriaque* was compounded by Heras, of Pergamus. A widely-known botanical garden for medicinal herbs was the property of Attalus Philometer, and the cultivation of medicine in general was in the able hands of Lycus, Pelops, Numisianus, Marinus, Satyricus, and Quintus, the last being an oracle of anatomy and the inspiration of many lesser lights among his countrymen. Pergamus, in Galen's time, when it numbered many illustrious physicians, was the only city where clinical teaching was prosecuted, and it is worthy of remembrance that, in the interval between the decadence of the Greek school and the revival of bedside instruction at Leyden, Pergamus was the sole conservator of this method. But the profession in Galen's birthplace was not a unit in belief. Dogmatism seized the city, and under its broad standard the most opposite doctrines were marshalled. Vagaries without number resulted from the attempt to reconcile Hippocrates's teachings with Plato's explanations. Chief was the dogma that diseases acknowledged an occult and an evident cause, the first seated in the body, the second in one of the ordinary circumstances known to produce disease. The word *occult* is suggestive of the sea of doubt which attended the determination of the occult cause. The earlier members of the school were divided as to whether it was to be found in a disproportion of the humors, or in a disproportion of the primitive elements. But times made humors and elements gave place to more definite conceptions, and principles grew more elastic, until even coction itself was no more an article of necessary faith. With all their shortcomings and inconsistencies, the dogmatists were by far the most respectable body of ancient practitioners, for, whatever the absurdity of thought that unbalanced men's minds for the time, the anatomy of the time was insisted upon, together with a long training in other departments, as the indispensable requisites of candidates for the practice of medicine.

Galen imbibed his methodism from Themison, of Laodicea. This physician acquired great celebrity in the management of chronic diseases, in which he made constant use of opium and hyoscyamus. A great admirer of Asclepiades, he became the founder of methodism in developing the ideas of his model. Democritus was laid under contribution to furnish the necessary atoms, the passage of which in too great or too little quantity through supposed pores in the skin was the whole basis of that doctrine, the absurdities of which we learned from Celsus.

Probably the most philosophic of the three schools of the time was the empiric. They alone recognized the vanity of the search after causes, not only because they held such search to be fruitless, but also because they recognized no benefit to therapeutics in known causes; of this latter assertion they supposed the truth shown, by adducing the illustration that a sword which makes a wound cannot indicate the means of cure. Experience was thus reasoned to be the only guide, but faith was greatly shaken when dependence on certain similarities, as guide to a treatment, sadly disappointed in diseases of a thoroughly opposite nature. The empirics made much of observation. To practise after their method required sharp senses and correct judgment, but they failed to appreciate their position as resulting from the ignorance of the time, and discouraged all attempts at improvement by prescribing anatomy and physiology as useless to a practical physician. Naturally, with such a sect remedies multiplied and compound specific medicaments were in high favor.

When Galen wrote, the distinctive boundaries of these schools had been well worn by time. The academicians—a sub-sect, bastard children of Socrates and Plato—did the most of the wordy disputing, and things were generally in such a mixed condition that a man might write what he would, and call himself Stoic, Epicurean, or what he chose. Galen's circumstances did not demand labor, and, had his taste so inclined, nothing would have prevented his becoming a most accomplished word-quibbler, but at seventeen one of his remarkable dreams saved him from this fate. These dreams played a most important part in Galen's life; nothing was determined on, nothing undertaken but at their suggestion. During the pest at Rome, other cowards willingly confessed that fear had driven them from the city, but Galen was above such a vulgar motive; nothing less than a convenient dream determined action on his part. Galen's eclecticism resulted from the many schools to which his tutors belonged. To Satyricus, the successor of the great anatomist Quintus, Galen owed his anatomical knowledge, Stratonius instructed him in the practice of medicine, and Eschrion imparted to the pupil the tenets of empiricism. Of all the sects, methodism was most in favor. The dogmatists had continued their refinements until the name of dogmatism was too heavy for their speculations, and now they called themselves pneumatists, from a fifth element, *pneuma*, added to the four already existent by Athenæus, of Attaleia, in Asia

Minor. Galen speaks of a new sect—the eclectics—so named from the attempt to reconcile pneumatism with the other philosophies. But although this refinement by a disciple of Athenæus received no personal indorsement from the physician, yet was Galen eclectic in the better sense of adopting any thing that recommended itself to his excellent judgment. Empiricism too changed, in that it attained respectability by reason of a literature founded on experiments, that largely multiplied because patients were the subjects and not physicians. In this hot-bed of partisanship, Galen's mind gained such strength that, at the time when he commenced his travels, he was absolutely unbiassed in favor of any of the winds of doctrine blown by his tutors. He first set out for Smyrna, and thence proceeded to Alexandria. Egypt, no longer imbued with the spirit of the first Ptolemies, had degenerated to the position of a field for the disputes of Greek dialecticians. Anatomy was the only study that he there found worthy of his attention. Even this had declined, for no Herophilus now used his scalpel to elucidate human anatomy; but, with the no mean aids of the human skeleton, and the bodies of the inferior animals, Galen found sufficient and congenial employment during the five years he remained at the capital. On his return to Pergamus the priests of Æsculapius appointed him surgeon to the gladiators of the Gymnasium, but a popular sedition compelled him to vacate his position, and seek an asylum in Rome. Apuleius, of Sicily, was a teacher and practitioner of great repute in the Rome of that day, but, according to the book attributed to him, he was almost alone in his glory. The city was full of ignorant and unprincipled men, who made the misfortunes of others the instruments of ill-gotten wealth; but, in spite of mountebanks and quacks, Galen fast rose in favor, the recovery of the wife of a consul, sick of a desperate malady, through his skill, securing many valuable patients, among whom was the emperor himself. But success was dangerous. He made no pretensions to magic, and a diagnosis such as is related in the well-known story of the way in which he convinced his friend Glaucō of his ability, was a triumph of legitimate skill, which naturally exposed him to the attacks of a multitude of charlatans. At the instance of his friends, he adopted the best method to silence his opponents, by opening a course of lectures on anatomy at the *Temple of Peace*. It was in this place that he publicly disputed the authority of Aristotle. The Stagirite had described a double heart as the property of all mammals except the elephant. Doubt-

less the size of this animal was sufficient reason, in the fitness of things, for endowing it with a triple heart, but the violence which the assertion of Aristotle inflicted on Galen's really advanced idea of type, was sufficient stimulus for the trouble attendant on procuring the body of one of these monsters, in order that analogy might be vindicated against such an attack. This mistake, or rather preconceived idea on the part of a man whose dictum was supreme authority, until the time of Bacon, effectually disposes of the argument of those who cite the fact that Aristotle believed all birds had a little spleen, as indication of a knowledge of type.

After returning from his disgraceful flight to escape the plague, Marcus Aurelius and Lucius Varus appointed Galen commissary to an expedition against some German barbarians, but sufficient excuse was found in the death of Varus, and in a timely vision, to resist the entreaties of the emperor. But, although Galen was left behind, Aurelius sorely felt the want of that *theriaque*, which, as prepared by the favorite physician, was an article of daily royal consumption.

Galen was an indefatigable worker. One hundred and sixty of his works are known to be lost. The disastrous burning of the *Temple of Peace* is chiefly chargeable with this, although in the long lapse of time some books have disappeared, a misfortune for which something besides fire is to be blamed. Still, we have eighty-two complete treatises, which there is every reason to believe are the most important of his works. The most popular, "*De Usu Partium*," gives descriptions of the organs, accompanied by a running commentary on function. Its great blemish is a plentiful distribution throughout the book of the cheap clap-trap of pious interjections, which remind one forcibly of a like practice by Lord Bacon. The "*Ars Medica*" and "*Methodus Medendi*" contain that system of therapeutics which for so many centuries was an object of worship to Arab and European. Sometimes we are inclined to believe that, if these works had never been written, the time so unprofitably spent in searching their pages to learn of the theory of temperaments, and the action of humors, might better have been devoted to a study of the disease which it was sought to match with a description in these authoritative writings. But whether it is wise to regret this submission; whether, with the essentially second-hand character of middle-age erudition, it is rational to expect there would have been any study at all in case there had been no authorities for the stimulus; how absolute was

his authority ; it is difficult for us to conceive. While he reigned, instead of clinical teaching, medical schools offered to students expositions of his works. Men came to love an easy master whom they had long served, present diseases were readily shackled with their types in Galen's classification, and though the *leech* sometimes bled the patient to death, such Sangrados were amply justified in the knowledge that it had been done classically.

Galen's doctrines have been said to be a direct deduction from those of Aristotle. As has been seen, the peripatetics made four qualities for the soul. Galen reduced these to three, the vital, the animal, and the natural—gave them local bodily habitations, and attributed to them all the phenomena of life. His mind acquired coloring from the pneumatists. In the term *pneuma*, he comprised the three above-mentioned qualities, which were known as *spirits* in this instance. He supposed the natural spirit to take its origin from the liver ; thence being taken to the heart, it is cooled by the inspired air, which latter also impart vital force to the *pneuma*. The *pneuma* in this condition is deprived of certain sooty particles, after which it ascends to the brain, and is there elaborated into the animal spirits.

Leaving this barren and stupid theorizing on nothing, we approach that part of his labor which is modelled most closely after Hippocrates. It must answer to note the simple fact that in the prognosis and management—not exactly synonymous with therapeutics—of diseases, in which departments the supremacy of Hippocrates has been referred to *ad nauseam*, he closely followed that authority, and consequently acquired an enviable reputation for sagacity. In other but allied subjects he had theories of his own, that Hippocrates would never have embraced, being foreign to the excellent method of the sage. Thus, Galen divided the pulse into sixty different varieties, reasoning that, as each disease had its specific remedy, so must each possess a characteristic pulse. A pulse for pleurisy, a pulse for phthisis, a pulse for a tertian fever, an hepatic pulse, were accurately described in his book, but even the touch of Galen himself was not always equal to their discovery.

Apes and other inferior animals constituted the material of Galen's demonstrations. Various as have been opinions on the question of his having opened human bodies, to-day we are in position to give an unqualified denial to his claims as a human dissector. Rufus, of Ephesus, who wrote at this period, and Galen.

himself, regret the necessity that confined their observations to animals, and the same authors counselled students to go to Alexandria, where at least the human skeleton might be seen. Galen, imperfect as were his means, demonstrated many new muscles, localized their attachments, and compared the opposed actions of the flexors and extensors. The "*Administraciones Anatomicæ*" contain the earliest clearly-given separation of the nerves from the ligaments, these two structures having been confounded together previously, and even Galen occasionally relapsed into the same error. This is a general statement; the cranial and certain nerves of spinal origin had been distinguished from tendons by Herophilus and others many centuries before.

Galen never approached the modern idea of nervous action. He looked upon some nerves as hollow tubes which conveyed a fluid secreted by the brain to the parts over which the trunks presided. But his usual supposition concerning their action was of the same nature as the idea of muscular power, with this difference, that nerves, unlike muscles, were not dependent on their size for power. He was compelled to take refuge in this provision, because of the numerous functions presided over by such a slender trunk as the pneumogastric. Galen performed numerous vivisections. He removed portions of the brains of animals, and watched the effects; he opened the spinal cord and almost anticipated Magendie in saying that, when the cord is cut longitudinally in the median line, there is no effect observable on either sensibility or motion; but when the cut is oblique or transverse, and involves but a lateral half of the cord, motion is lost upon that side of the body, for all parts supplied by nerves taking origin from that portion of the cord below the section. Further, when the cord is completely divided at any portion below the fourth vertebra, sensibility and motion are lost on both sides, for all parts supplied by nerves taking origin from that portion of the cord below the point of section. If the cord be divided at its origin, the animal dies; if between the third and fourth vertebræ, respiration is abolished. Galen was fond of eliciting wonder by striking experiments, of which the following is an example: The intercostal nerves were exposed at their origins; threads, loosely knotted, passed around each trunk, and at a given signal a number of assistants tightening the ligatures, the animal who previously uttered loud cries, immediately became silent.

Galen was also acquainted with the effect on the voice of di-

vision of either the pneumogastric nerve or of its recurrent laryngeal branch. It is of peculiar interest to read of these matters, which are subjects for demonstration to physiological classes of to-day.

Galen was thoroughly possessed with certain favorite dogmas which exercised a most injurious influence on his investigations. That Nature makes nothing in vain, that every part is constructed after a type unsusceptible of improvement, sets aside all ideas of development, and recognizes none of the changes which result from natural selection. These deductions from certain Aristotelian doctrines caused that limitation of Infinite Power which resulted so disastrously to truth in many special instances, of which Galen's disquisition on the hand is the best illustration. The hand was held to be an instrument so admirably adapted to its uses, that any improvement in its construction cannot be imagined. Let it be remembered that the hand, of which so much is said, is the hand of the ape, specially adapted for grasping the limbs of trees in climbing, and in which the characteristic of the human hand—opposition of the thumb and fingers—is wanting. Thus, Galen's dogma becomes absurd; when put in direct language, it affirms that the hand of the ape is perfect—that "Nature" is incapable of improving such an imperfect instance of type.

Lastly, as embodying many important Galenic doctrines, must be mentioned the celebrated work on "*Affected Places*." The great physician, ignorant of physical diagnosis, and possessing no instrumental means of interrogating disease, if we except the sound for determining the existence of a vesical calculus, was compelled to rely on symptoms and external phenomena. From Erasistratus he learned the relation suppose to exist between the nature of the affection and the diseased place. Certain symptoms were justly supposed to be of preëminent importance in diagnosis, and because these were dependent on the structure of the part, anatomy was held to be as necessary to the physician as to the surgeon. He recognizes the impossibility of logical certainty in the task of discovering the nature of disease, assigning a legitimate province to reasonable conjecture; local affections he believed dependent on the permanent diathesis, as well as upon what he called the momentary sympathetic diathesis. Lesion of function, he asserted, presupposed lesion of the corresponding organ, but it was paradoxically maintained that the organic affection, acting as the etiology of the functional affection, did not manifest itself always at the

seat of the latter. Lesion of function may be known to have occurred, when there is persistence of lesion of an organ. A critical evacuation may dissipate both the lesion of function and that of organ, as the pain and functional disturbance resulting from intestinal disease pass away with the discharge of a peccant humor from the bowels.

Diseases in general were divided into two classes : simple, such as an inflammation or dyscrasia ; and organic, in which there was profound alteration of structure in the affected parts. The affected place should suggest the nature of the disease, and the nature of the disease should suggest the appropriate remedy.

Report of the State Board of Health of Massachusetts

In this goodly volume of 329 pages, we are furnished with a general report of the State Board of Health¹ on the sanitary condition of Massachusetts, and several highly-interesting and instructive papers on subjects relating to practical hygiene. The general report contains a sketch of the proceedings of the Board under the law concerning slaughter-houses, and noxious and offensive trades. The various contests with bone-boilers, slaughterers, etc., are recorded, and we are given a lively sketch of the efforts of the Board to rid the community of the whole slaughtering nuisance. It appears that not only were the good people near Boston annoyed by the offensive way in which slaughtering was carried on in their vicinity, but they were, in addition, the victims occasionally, but by far too frequently, of unscrupulous butchers, who, like some of the same fraternity nearer home, furnished their tables with a little occasional variety in the shape of diseased meat. The beautiful town of Brighton, near Boston, was a particular sufferer from the slaughtering nuisance ; but when, a year ago, the Board proposed the erection of an abattoir, where the whole process of slaughtering, bone-boiling, fat-rendering, etc., would be concentrated, to the great relief of suffering Brighton, the indignant butchers stood upon their rights, and declared one and all, that "they would none of it." Being from force of immemorial habit, as well as interest, conservative of their old privileges, they considered it their duty to protest against this attempt to subordinate their particular interests to the general good. We

¹ Third Annual Report of the State Board of Health of Massachusetts, January, 1872. Boston : Wright & Porter, State printers.

are happy to learn that the butchers' protest was in vain. The plucky Board prevailed over their combined strength, an abattoir was projected on the border of the Charles River, and the contest, has so far terminated as merrily as an old play. We find that, by the act incorporating the "Butchers' Slaughtering and Melting Association," the Board is directed to see that the buildings are properly managed, and to prescribe rules for the future guidance of all who carry on their trades within the enclosure. This law, and a rigid system of inspection, will prevent the slaughtering of any diseased animal or the sale of any flesh unfit for food. The new arrangement will also increase the profits of the Brighton butchers, for the meat of the Brighton abattoir will be preferred by all prudent consumers.

But the energy of the Board has accomplished another work of, in our opinion, still greater importance, inasmuch as the evil was an ever-present and a constantly-increasing one. Of all the low tenement-houses of Boston, the so-called *Crystal Palace* was the lowest and the most infamous. It was the familiar scene of "riot, disorder, arrests for drunkenness, and family broils; and the objective point toward which the lowest vagabonds of the surrounding neighborhood congregated." Women, and even children, were daily violated there, and drunkards slept off their debauches in its corridors. It was nothing but a pest-house, and a moral blot upon the whole neighborhood. It will be worth while for our New York authorities, who must one day make a systematic effort to remedy the evils of our tenement-house system, to learn from this report the simple way in which such a nuisance was effaced. And, first of all, the State Board of Health took the matter well in hand. In a report issued last year they drew attention to the evil, and at the same time furnished the public with some statements which, if we may judge from subsequent action, astonished them not a little. This action was none other than the practical one of incorporating a body of energetic citizens to be known as the "Boston Coöperative Building Company," having for its object "the building and hiring of tenements for the poor, with the idea of improving the abodes, and thereby benefiting the people, sanitarily and morally." It soon had sufficient capital to commence the erection of a block of buildings on a large lot of purchased land on East Canton Street, Boston. But the most satisfactory proceeding of the corporation was the hiring and remodelling of the *Crystal Palace*, an undertaking which has

already produced gratifying results. From a nest of criminals it has been transformed into a neat and orderly dwelling. Its name has been changed to "Lincoln Building." A coffee-house will take the place of its grog-shop, and fresh air and sunlight will be allowed free access to its every nook and cranny. A spirit of providence and industry has been introduced among its inmates. "A sewing-school has been established, and indications of thrift and foresight are already apparent in the savings which have been deposited in the Five-cents Savings-Bank of Boston." These are results which entitle the Board to public gratitude. We earnestly hope the day is not far distant when our own Board will accomplish something in the same direction equally deserving of commendation.

By far the larger part of the work before us is taken up with monographs on various sanitary topics, all handled in a manner highly creditable to their respective authors. Our limited space not permitting us to give an equal share of attention to the claims of all, we must reluctantly content ourselves with glancing at such of their number as appear to be of most importance.

We begin with Dr. Frank W. Draper's paper on "Arsenic in certain Green Colors." The green coloring-matter so commonly put on paper-hangings, articles of wearing-apparel, sweetmeats, children's toys, lamp-shades, and other articles too numerous to mention, is of two kinds, one containing arsenic, the other free from it. Two of the arsenical pigments, Scheele's green and Schweinfurt green (the latter so called from the town of Schweinfurt, where it is manufactured), are largely composed of arsenic, in the form of arsenite of copper, or Scheele's green, in the former, and of aceto-arsenite of copper in the latter. Both are called indiscriminately "emerald," "mineral-green," "Brunswick-green," and "Vienna-green;" the latter two, however, are misnomers. Scheele's green contains 55 per cent. of white arsenic (arsenious acid), and Schweinfurt green 58 per cent. An estimate of the very large amount of arsenic used in the manufacture of these pigments may be formed from the statement of a manufacturer of paper-hangings in England, who declared, in 1860, that he used two tons of this poison a week, as also from the estimate, made in 1862, that between five and seven hundred tons of the pigments were annually manufactured in the same country. By means of a simple chemical test, any one almost can tell whether a given substance contains arsenic or not. It is this: place the material to be

tested, whatever it be, in *aqua ammoniac*, and if it contain arsenic the liquid will turn blue. Assurance may be made doubly sure by dropping a little of this blue liquid on a crystal of nitrate of silver, when the yellow arsenite of silver will be obtained.

Such are the highly-poisonous pigments which enter so largely into the composition of many popular articles of commerce, such as paper-hangings, green tarlatan, artificial leaves and bouquets, and the green paint with which we yearly renovate parts of our houses. The following is our author's description of the careless way in which the pigment is often applied; he is narrating the process by which artificial flowers and other articles of dress are made: "The process of manufacture is a simple one. Generally, the texture from which the leaves are to be cut is colored in the piece. The coloring-matter is made by thoroughly stirring together a mixture containing in definite proportions the green pigment, cold water, and starch, gum-arabic, or some similar substance, which shall give the color consistence and adhesiveness. Not unfrequently, in this process, the hand and forearm are freely used in the liquid, to expedite the work. Of this mixture, properly prepared, the workman takes a quantity in his fingers, and roughly spreads it over the muslin or fine calico. The fabric is then beaten and kneaded between the hands until it is uniformly colored; the longer this process is continued the more perfect is the result. The cloth is now fastened to a frame for drying. In all this process of coloring, the hands, forearms, and frequently also the face of the operative, must become soiled with the green color. *It will be observed that the color is but loosely applied, no mordant being used, as in calico-printing, to fix the pigment in the texture of the cloth.*¹ Hence we are prepared to learn that both makers and wearers of such artificial productions suffer, in some instances, seriously. Among the operatives, those portions of the body which are most exposed to contact with the poison, as the face and the hands, suffer most. Various eruptions, erythematous, papular, vesicular, form on these parts, which are also sometimes attacked by the more serious states of ulceration and gangrene. Even death has been known to result from this occupation. Our author quotes from the *Medical Times and Gazette* for November 30, 1861, the case of a girl, aged nineteen years, who, after being engaged for eighteen months in "making artificial flowers with emerald-green, died in London with all the characteristic symp-

¹ The *italics* are our own.

toms of chronic poisoning by arsenic. Her sufferings were very greatly intensified toward the close of life. Examination after death discovered the very evident presence of arsenic in the internal organs."

The number of deaths, however, is not so great as one might *a priori* suppose, the reason being that, as soon as operatives begin to experience the local irritative effects of the pigment on the skin, eyes, and mouth, they desist either for a season or altogether. These local irritative effects usually begin to appear in a few weeks after work is commenced. They comprise, besides the cutaneous eruptions already noticed, palpebral conjunctivitis, sneezing and running from the nostrils, soreness of the mouth and throat, swelling of the tongue, dry cough, dyspnoea, loss of appetite, often vomiting and purging, attended with griping and abdominal tenderness. These are followed by a set of constitutional symptoms indicative of malnutrition and nervous prostration, namely, emaciation, debility, palpitations, tremors, headache, and vertigo. It is not to be supposed that these symptoms follow in all cases of exposure to arsenical pigment. Just as there are people who escape other morbid agencies, though living in the very midst of them, so there are a few who seem to have the power of resisting the poisonous effects of the coloring-matter under consideration. Interested persons have used this fact as an argument against the general experience of those who condemn the use of such pigments. But we quite agree with Dr. Draper that such an objection is worthless. The experience of a host of candid inquirers is against it. The rule is, that arsenical pigments occasion symptoms of arsenical poisoning. If the exception were made to disprove the rule we could have no ground of certainty in any department of science or art.

Artificial flowers, leaves, etc., are made to take up a very large quantity of arsenical pigment. "Hoffmann found ten grains of pure arsenic in a single twig of ten leaves." The light texture, named tarlatan, of which ladies' dresses are often composed, owes its beautiful green color to arsenical pigment. It is said to contain nearly half its weight of this poisonous compound. Dr. Draper bought a square foot of it in a Boston retail-store and had it analyzed by Prof. Nichols, of the Massachusetts Institute of Technology, who found it to contain 8.12 *grains of arsenious acid*. At this rate a tarlatan dress would hold about *four or at least three ounces of arsenic*. A finely-dressed lady in a ballroom thus unwittingly

ingly becomes a source of disease, and maybe death, to all in her vicinity, admirers as well as rivals. Every movement of her body, every rustle of her dress, sends a light cloud of arsenical pigment into the air, for it must be remembered that this pigment is very loosely applied, "no mordant being used to fix it in the texture of the cloth." Hence, the most ordinary disturbance of the texture, as in handling, measuring, making-up, fitting, and wearing, will serve to distribute its arsenical coating through the air. The work before us contains numerous striking examples of the injurious consequences which afflict those who have to do with the manufacturing, vending, making-up, and wearing, of such articles.

It will be a great relief to the rising generation, especially that portion of it which is still in the candy period, to learn that arsenical green is now seldom or never used to color sweets. In this respect they enjoy an advantage over their predecessors for which they should be exceedingly thankful. For, formerly, the manufacturers of such articles were not so enlightened or so scrupulous as they are now, and the consequence was, that many a little stomach had cause to rue the fatal moment that first caught it coveting the treasures of the confectioner's window. Even at present, and in face of the outcry raised against all such practices, the pastry-cook can not always resist the temptation to ornament his artistic productions with the deadly pigment. Doubtless a triumph of art outweighs in his estimation all paltry considerations of human health and life. Of this passion of caterers our author gives us the following example :

"M. Chevallier relates that, at a grand dinner-party in Paris, attention was directed to a boar's head which had been curiously decorated for the occasion. The ornament consisted of masses of fat, colored alternately red and green, so arranged as to give quite an artistic effect. One of the guests, well acquainted with chemistry, was struck with the rich green color, and reserved a portion for private analysis. He found the coloring-matter to be pure Scheele's green, forming about two per cent. of the weight of the fat. It appeared on inquiry that the butcher's boy had procured the color from an adjacent shop, in spite of the regulation prohibiting its sale."¹ Luckily for the man to whose creative genius this decoration owed its existence, he was absent on this occasion, or we fear such barbarous curiosity on the part of M. Chevallier would have completely ruffled his equanimity.

¹ In France the sale of arsenical pigments is prohibited by law.

The pent-up feelings of artists will, however, find a vent. Arsenical green strikes them as being so beautiful a color that it is a pity not to put it somewhere. If they would only consent to apply it to themselves, we should have no particular desire to object! But we do emphatically protest against their practice of daubing it on children's toys. Almost the first thing a child does with a toy is to stick it in its mouth. The coloring is so loosely put on—being merely mixed with water, and laid on the wood—that contact with the saliva, or with a moist hand, immediately removes it, to the imminent risk of the child's life. In fact many children have been poisoned in this very way.

Nearly all green paper-hangings contain arsenic, the lighter shades generally less than the darker. Two specimens accompany the text. One, of a light shade, "contains 5.42 grains of arsenic in each foot. The other, which is typically arsenical, and represents the color in its purity, has 29.32 grains of pure arsenic in each square foot. . . . Taking the average of these results, a room of ordinary dimensions, decorated with arsenical paper-hangings, would hold on its walls considerably more than a pound of poisonous coloring-matter, containing half its weight of arsenic." There are three chief varieties of green paper-hangings, due to differences in the process by which the coloring-matter is put on, viz., unglazed, stained, and flock. In all these the pigment is made to adhere to the paper by means of size. Satined paper is obtained by a subsequent process of glazing. For this purpose the pigmented paper is passed through a series of dry brushes revolving with great rapidity. To get the flock-paper, the unglazed material is varnished and immediately sprinkled, by means of an appropriate apparatus, with flock, a substance composed of "the finely-divided shreds of waste woollen cloth." Of these varieties the unglazed is the most dangerous, because the slightest disturbance of it shakes out the pigment; the glazed is the least hurtful, and the flock occupies an intermediate position. All are, however, deserving of condemnation, and the work before us cites numerous well-tested examples of their deadly influence, some of which we would willingly transfer to our pages did the limits of this notice permit.

The remainder of the paper is devoted to the subject of sanitary protection. Its author questions the efficacy of prohibitory legislation as a corrective of the evil, and relies chiefly on the diffusion of information regarding it among the public.

Dr. Draper has done his work well, and we cannot take leave of his excellent paper without expressing our sense of its merits. It presents a wide view of the subject, in a clear and concise style, and has altogether substantial merits, rendering it a contribution of considerable importance to the literature of this subject.

Under the title "Intemperance as seen in the Light of Cosmic Law," Prof. Bowditch, chairman of the Board, gives an analysis of a correspondence with foreign countries, which was presented to the Massachusetts Legislature in 1871, "On the Use and Abuse of Intoxicating Drinks throughout the Globe." He arranges what he has to say on this important subject in the following order:

1. Intemperance, according to isothermal lines.
2. Intemperance, according to race.
3. Intemperance, according to the character of the stimulant used.
4. Intemperance, as influenced by the culture of the grape.

Under the first heading, his purpose is to prove that the desire for stimulants, though universal among mankind, is greatly modified by a climate-law which may be briefly stated thus: The desire for stimulating beverages increases in a direct ratio to the distance north and south of the equator, or in an inverse ratio to the temperature. Thus, within the isothermal lines 77° Fahr. north and south of the equatorial line of $82^{\circ} 4'$ Fahr., the desire for stimulants is said to be 0° , and there is no intemperance. North and south of this space, or between 77° and 50° , the grape-vine grows to perfection, and light wines are the beverages common to all classes; intemperance is rare, and branded as a crime whenever it does occur. Northward, and perhaps southward, of the line 50° , the grape-vine grows less luxuriantly, and gives an inferior yield, as well as quality, of wine. This is the region of ardent-spirit drinkers—Russian, Scandinavian, Anglo-Saxon and Celtic of Great Britain. Ceylon alone, of all the lands south of 50° , is a spirit-drinking country, an exception due to its having been, for three generations, a British colony. Hence, according to this law, if law it be, the hotter the country, the less the desire for ardent spirits; or, conversely, the colder the climate the greater their consumption. This is doubtless true in the aggregate, but we incline to think that Prof. Bowditch attaches undue weight to the direct influence of temperature on the consumption of ardent spirits. We cannot acquit him of exaggeration when he declares that "the northern babe, *by the very fact that he is born amid snows,* tends more to fall into intemperate habits than his *young peer*

of the tropics.”¹ Without questioning the fact that the people of the north are more addicted to intoxicating beverages than those of the south, we are not sure that it can be explained by the hypothesis of thermal influence alone. On this theory the native inhabitants of the Northern and Eastern States of our Union ought to be more intemperate than those of the Southern, which, however, is not the fact; and there ought to be more ardent-spirit drinkers in winter than in summer, which we do not believe. Temperature, no doubt, has its effects in this matter of drinking; but climate, meaning thereby the various atmospheric and telluric influences, is of still greater importance. Yet even here a great deal of the current speculation of the day has no basis in accurate observation. It is said that Englishmen find they cannot indulge as freely in this country as they could in their own, and this has been set down to climate, though it is first a question whether it may not be due, in part at least, to other causes, such as the different quality of the liquor consumed, and the prevalent drinking-habits of the American people.

The paper dwells at considerable length, and with much force, on the moral and material injuries which nations sustain through excessive indulgence in intoxicating drinks. It shows that the percentage of crime increases in proportion to the amount of strong drink consumed. This is indicated by the following table compiled from the report of the chief of police of Boston, and giving the percentage of prisoners in each of the two chief foreign nationalities of that city:

	Irish.	German.
Population.....	56,900	5,606
Number of prisoners.....	14,673	364
Percentage of prisoners to population.....	25.78	6.49

The explanation of this very striking difference is chiefly to be found in the kind of liquor consumed by the two nationalities. The German drinks lager-beer, holding from five to six per cent. of alcohol; the Irishman indulges in strong spirits, containing from forty-four to fifty-four per cent. of alcohol. The latter will drink probably a pint of whiskey a day, equivalent to, at the very lowest estimate, five ounces of alcohol; the former commonly stows away a quart of lager in the same time, but then this quantity contains probably not more than two ounces of alcohol. It is easy to understand, therefore, the reason why crime, growing out

¹ The italics are our own.

of intoxication, is so much more frequent among the Irish. As for the effects of the two drinks on the general health, there can be no doubt that lager is the less injurious. For, even with the daily consumption of three pints of lager, only about three ounces of alcohol would be taken, or double the amount which the accurate investigations of Dr. Anstie have ascertained to be the limit of healthy indulgence. The majority of Germans do not average more than this quantity daily, and hence the comparative infrequency of crime among them.

It would astonish us not a little if we knew the material loss inflicted upon the world by intoxicating drinks. The Irish laborer spends his hard-earned wages in the corner grog-shops, leaving his wife and children to starve at home. The Gallican peasant barter the produce of his fields for the corn-brandy which he loves. Here in America the amount annually expended in liquors almost exceeds computation. Facts such as these have awakened thoughtful men to the necessity of devising some means by which this terrible vice can be stamped out. One party, having mixed political and social aims, has heretofore had most to say on this question, and has used its influence to force total abstinence on an unwilling people. Prof. Bowditch, we are happy to say, repudiates this party, and takes his stand with the increasing number of philosophical men who hold that it is vain to attempt to make people sober by act of Legislature. These would stamp out drunkenness by elbowing whiskey out of the market, a result which they propose to accomplish by popularizing home-made wines and lager-beer. If this be really practicable, and we see no reason why it should not, the community may expect to experience its greatest moral and material blessing. Our country affords every natural facility for the growth and cultivation of the vine. From the great lakes on the north to the Gulf of Mexico on the south, there is hardly a State of the Union which could not be made to yield its own wine. Already California and Ohio have taken the lead in this enterprise, and many other States will, we hope, soon follow. But, even should the yield of wines not fulfil public expectation either in quality, quantity, or cheapness, we could still fall back on lager-beer. By all fair means let strong drinks be banished from the market, and, if men must have stimulants, let them take something which, when put into their mouths, will not steal away their brains.

It is chiefly as a valuable contribution to this much-needed re-

form that we welcome Prof. Bowditch's paper, and congratulate him on the ability with which its points are stated.

The influence of sewing-machines driven by foot-power, on the health of operators, is the subject of a very suggestive paper by Dr. Arthur H. Nichols. After examining testimony from a variety of sources, including physicians, operators, and employers, the conclusions arrived at are:

1. A healthy woman may use the sewing-machine for three or four hours daily, without evil results.

2. The prevailing illnesses of operatives are: (a) Indigestion, due to constrained posture, close confinement, and defective hygienic arrangements; (b) muscular pains of the legs and trunk, caused by overexertion at the treadle; (c) uterine and ovarian disorders, aggravated, though not originated, by this occupation, and alleviated by its discontinuance; (d) general debility, the result of overwork and confinement.

The neuralgic affection of the feet noticed by M. Guibout, and attributed by him to contact of these parts with the iron treadle, is pronounced extremely rare.

Much can yet be done to diminish the unwholesomeness of this species of labor, by substituting some other than foot-power to work the treadle. Various modifications have been already made in this part with a view to obviate its evil effects, among which the most important are Parson's and Hall's improvements; but the probability is, steam will, before long, relieve overtaxed woman of the most wearisome and injurious part of sewing-machine labor.

The other papers of this volume are: "Mill-Dams and Water Obstructions," by the Secretary, Mr. Derby, of Boston; "The Adulterations and Impurities of Food," by Mr. H. B. Hill, of Harvard University; "Proper Provision for the Insane," a very practical paper by Dr. Edward Jarvis; "The Use and Abuse of Opium," by Dr. F. E. Oliver, which contains a good deal of useful information regarding the opium-habit. Fully fifty per cent. of the opium annually imported to the United States "is used for other than its legitimate purpose;" "Vegetable Parasites, and the Diseases caused by their Growth on Man," a very instructive contribution by Dr. J. C. White; and the synopsis of a correspondence on the "Health of Towns." The whole form a volume highly creditable to the Massachusetts Board of Health. We commend it to the attention of our Metropolitan Board, whose contributions

to medical and medico-social science are not in proportion to its exceptional opportunities of study and observation. What are called the "industrial diseases" are daily pressing more and more on the attention of physicians, and it ought to be one of the most important aims of our Board of Health to collect such observations as will afford a reliable basis for the study of the injuries and diseases peculiar to each trade and profession. We hope we shall soon have an opportunity of congratulating our Board on the publication of material as valuable as that contained in the volume before us.

Fournié on the Nervous System.

DR. FOURNIÉ'S book very opportunely fills a place in the literature of the nervous system. So much has been written upon the physiology of the nervous system, with a clear anatomical basis, that when a writer goes into the comparatively-unknown realm of psychology, and establishes a system of physiology *there*, he is bold indeed.

Dr. Fournié's work considers, then, the physiology of the mind, its qualities, the motions and the production of thought theoretically demonstrable, by a series of material changes in the cerebro-spinal organs. He theoretically proves that all involuntary impulses are dependent upon a physiological change, in the centres from which they emanate, and the power productive of the different acts of the animal organism he calls "*la vie fonctionnelle*."

He first argues the following points: 1. The possibility of establishing the physiology of the nervous system upon a natural basis. 2. To determine the nature and functions of the nervous system. 3. The number and classification of the intrinsic functions, and the functions that compose the nervous system. This vast subject is one that has agitated the human mind for centuries, and it is no wonder if Dr. Fournié is vague in his conclusions. He arrives at the following facts, however: that the functions of the cerebral powers of relation (*les fonctions cérébro-motrices de relation*), the cerebral functions of reproduction, and nutrition represent all the possible transformations produced in the brain in functional movements. That the brain furnishes a power that controls organic life. This he calls "*incitation motrice*." This "*incitation motrice*" is the functional product of the brain,

¹ *Physiologie du Système nerveux cérébro-spinal. D'après l'analyse physiologique des mouvements de la vie. Par Édward Fournié. Delabaye: Paris, 8vo.*

and is also given: 1. To the apparatus of relation; 2. To the organ of nutrition; 3. To the organ of reproduction; but at the same time that it gives its produced function, the brain does not cease to be a living special organ, that is to say, an organ perceiving, and recollecting. "It results from this *modus vivendi*, that the brain perceives the results of its function, and can constantly implant an activity more or less developed according to the necessity, with the aim to affect, and conduct in a perfect manner, the relations of the apparatus that put it in communication with the outer world."

He gives the classification of the intrinsic functions, as the cerebello-motor, the cerebro-motor, the medullar-motor, etc., and the functions composing relation, nutrition, and reproduction.

Dr. Fournié's deductions are rather mystifying to the mind of the ordinary reader, and the *Archives générales*, in an excellent review of the book, says: "Nous n'ignorions pas l'existence du cerveau, du cervelet et de la moelle, et beaucoup de naturalistes s'étaient crus autorisés à admettre des fonctions de relation, de nutrition et de reproduction. Appeler mouvements ce que l'on a appelé jusqu'ici fonctions, facultés, etc., ce n'est pas réaliser un progrès méritoire sera-t-on plus éclairé de savoir que la fonction cérébro-motrice de nutrition se compose: de la succion, de la mastication et de la déglutition," etc.

The book devotes several chapters to psychology, insanity, the physiology of language, and other interesting subjects. Dr. Fournié is a writer of great power, and although some of his chapters are rather heavy, owing to "la demi-obscurité qui résulte de la nature du sujet," the work is an interesting and instructive one.

Man and his Dwelling-place.

THE author of this volume¹ would seem to have experienced no little difficulty in evolving it out of the depths of his consciousness. It is intended to show that "the study of Nature leads to the conclusion that there is a defectiveness in man which modifies his perception; that the universe is not truly correspondent to his impressions, but is of a more perfect and higher kind." The argument, freed from the encumbrance of a labored and, at times, vague style, seems to be briefly this: Nature is wrongly charged

¹ Man and his Dwelling-place. An Essay toward the Interpretation of Nature. By James Hinton. New York: D. Appleton & Co.

with inertness by man. This inertness is apparent, not real, and due altogether to a defect in man himself, through which he is unable to know the substance of things. This defectiveness is what the Bible means by death; and science, by removing it, causes man to rise into a new life, in which he will know the absolute substance. This alone is real, all phenomena or sensible particulars being mere mockeries due to human defect alone. Hence we have here another transcendental attempt to amalgamate Platonism and the Sacred Scriptures with science, as the regenerator of mankind. It is some little comfort to be told that we may judge rightly of Nature if we do not suffer ourselves to be guided by our own impressions merely, but remember man's defectiveness; though, if, as is insisted on throughout this book, man is so very defective that, in his present state, he cannot possibly comprehend Nature, we do not see that very much is gained, after all, by the information. It is true we are informed, further on, that science restores the equilibrium between man and Nature by emancipating him from his error; but, on the author's own showing, this is claiming a little too much for science. For science, being the product of defective man, must share in his imperfections, and can hardly therefore be relied upon to emancipate him from his defects. The besetting fault of the author is his propensity to clothe such words as Life, Science, Nature, with abstract existences.

The book has gone through three editions, a sufficient proof of its popularity. We are not at all surprised at this. It is particularly welcome to a class, very numerous in our day, who, equally devoid of scientific conviction or of spiritual faith, are disturbed by a feeling of unrest, of vague longing, impelling them to seize whatever theory promises to solve the perplexing mysteries of life.

The publishers have done their part well; paper and type are the best that could be desired.

Astronomy and Geology compared.

THIS neat little volume¹ comprises three essays, marked by a vein of liberal conservatism. Their author is an English statesman, in the seventy-fourth year of his age, who, amid the scenes.

¹ "Astronomy and Geology compared." By Lord Ormathwaite. New York: D. Appleton & Co.

of a busy and active life, has found time to keep himself abreast of the stirring scientific controversies of the day. They were written down to his dictation, the decay of his sight necessitating this mode of commission to paper.

The first essay is entitled "Astronomy and Geology compared." It sets forth, in simple language, the different nature of the proofs on which these sciences rest, and how astronomy is the more perfect of the two, in consequence of being founded on the "double basis of observation and pure mathematical reasoning." Further than this it contains nothing of note.

The criticism on the views of Darwin and Buckle, which forms the burden of the second essay, is the pith of the book. The author is a supporter of that strongest of all arguments in favor of the existence of the Deity, the argument from Design. He is not quite satisfied as to Mr. Darwin's belief in an intelligent First Cause, at times calling it in question, and then again, in another place, citing him as one of its supporters. He is a warm advocate of the theory of special intervention, and as uncompromising an opponent of the scientific hypothesis of government through uniform general laws. We have here the old argument, unenlivened by any thing of an original or even striking character, and debarred from sympathy by the blind folly of insisting that a doctrine is atheistical which prefers to regard Providence as conducting the operations of Nature through determinate laws. Prejudice could hardly be carried further than the following: "They" (meaning, of course, Mr. Darwin's writings) "are subversive of religion. . . . A pious Darwinian would be a contradiction in terms" —language which, to say the very least, is out of place in a work dealing with scientific problems. Notwithstanding these imperfections, the chapter under consideration is well worthy of perusal.

The third essay is entitled "Progress." It contains nothing worthy of special notice.

On the whole, the book is of more importance as evidence of the interest taken by the most conservative class of English society in the scientific topics of the day, than for any special merit of its own.

Life in Nature.¹

THE organism is here considered as composed of material elements *plus force*. Chemical action is the cause of its functional

¹ "Life in Nature." By James Hinton. New York: D. Appleton & Co.

manifestations, force their result. There is an endless circulation of this force in Nature, what is stored up in the vegetable world being surrendered to man in the process of assimilation, and by him again given out through the action of his various organs. Force accumulates in the body in proportion as chemical action is resisted. These two powers being evenly balanced, the organism is in a condition of equilibrium. But when, through some obscure cause, or a known stimulus, this condition of equilibrium is for the time disarranged, chemical change follows, and function is the result. The functions are therefore sequences of chemical action, which latter also accompanies every change in organic equilibrium. This organic equilibrium it is the office of the vital force to maintain and restore. Formerly the mistake was made of reversing these facts. The organism was said to have a power of acting. The truth was ignored that "with every such exhibition of power there was connected a change in its composition." Instead, therefore, of premising the existence of an active power, and hence inferring the decomposition of the body, it would be more correct to affirm first the decomposition and then to deduce therefrom the power of acting.

The book is tinged throughout by the author's peculiar, and, as we have already indicated, erroneous views regarding man and Nature; but it is thoughtfully written, and will be found worthy of attentive perusal.

CHRONICLE.

I.

LETTER TO THE EDITOR FROM DR. GEORGE FIELDING BLANDFORD, LECTURER ON PSYCHOLOGICAL MEDICINE IN ST. GEORGE'S HOSPITAL, LONDON.

DR. ARTHUR MITCHELL devotes two lectures to the consideration of the medico-legal relations of insanity to will-making, and commences by observing that there are degrees of insanity, and different kinds of mental disorder. For example, he says: "To take away a man's personal freedom in order to provide for his care and treatment, to deprive him of the management of his property, to upset his last will and testament, though certainly important things, are not of such importance, in the eye of the law, as to hold a man irresponsible for criminal acts. Consequently a clearer and fuller evidence of insanity is required to

establish this freedom from responsibility. Each of these results is based on the existence of insanity, but for each of them a different degree or kind of insanity is required. All through the law, in fact, there is reference made to the degree of mental disease—deeper signs of disease being required in some circumstances than are required in others. The law declares that a man may be so far insane as to justify his detention in an asylum, or so far insane to require a *curator bonis*, or so far insane as to make void his will, or so far insane as to free him from responsibility. I believe that every one, who has studied the numerous decisions, in cases in which the question of insanity has been raised, will have seen that there is throughout them, taken as a whole, the recognition of the need of a small, a great, and a greater insanity, according to the nature of the results which are to follow its declaration. The question, then, before us is, What are the particular degrees and forms of insanity which render a man's will invalid?"

But first Dr. Mitchell considers the principles on which a man is held to have a right to regulate the disposal of his property after his death, because the nature of this right must influence us when, for any reason, we are asked to disregard it. These principles he enunciates in the words of Chief-Justice Cockburn in his decision of the case *Banks vs. Goodfellow*, which apply to the law of England the Roman law, and that of the Continental nations which have followed it, securing to the relatives of the deceased a fixed portion of the inheritance. The law of Scotland rests on the same principle as the English, but here too there are restrictions, wives and children having claims which cannot be overlooked, and which rank as debts due by the estate of the dead husband or father. In England, with few exceptions, the law leaves a man free to make arrangements for the disposal of a part or the whole of his property after death; and it gives this power because it is believed that a more just disposal of it will be attained in this way than by any distribution prescribed by law. It thinks that the obligations of consanguinity, and the ties of affection, will assert themselves; that there should be a power of rewarding kindness, and of abstaining from the reward of neglect; that it proves a stimulus to the acquisition of property, and to thrift and orderly living; and that it tends to secure for old age the kindness and care of which it often stands in need. In short, the right of a man to dictate the disposal of his property is one which the law holds in respect, as based on something deeper than mere law, and accordingly a will cannot be broken on frivolous pretences, but the grounds on which it is upset must be clear and sufficient.

One of the grounds on which a testament may be declared void—the only one with which we have to do—is the insanity of the testator.

Sir Alexander Cockburn on the same occasion said: "It is obvious that to the due exercise of a power involving a moral responsibility thus grave, the possession of the intellectual and moral faculties common to our nature should be insisted on as an indispensable condition;" but the question arises, What are these faculties? Attempts have been made to define the nature of this competency. It is said to be "judgment to discern with perfect memory;" "a disposing memory

so as to be able to make a disposition with understanding and reason." But this is merely giving names—what is a *disposing* memory? It is as hard to define as sanity or insanity. In the same cause the lord chief-justice said: "It is essential to the exercise of the power of willing, that the testator shall understand the nature of the act and its effects; shall understand the extent of the property of which he is disposing; shall be able to comprehend and appreciate the claims to which he ought to give effect; and with a view to the latter object, that no disorder of the mind shall poison his affections, or prevent the exercise of his natural faculties, that no insane delusion shall influence his will in disposing of his property, and bring about a disposal of it which would not have been made otherwise." The testator, according to this, must be sane to a certain extent; he also must not be insane in certain directions. Mental competency, then, implies the possession of something, certain signs of sanity, and the absence of certain signs of insanity.

Before discussing the mental states which lead to incompetency, Dr. Mitchell makes the following remark: "I am desirous to point out that in all medico-legal questions, but especially I think in those which relate to wills, we deal with the signs or symptoms of insanity, rather than with mental diseases. Thus, what a delusion relates to, may, in the settlement of the question, be practically of more importance than the mere existence of a delusion. It may also be of importance to show in what parts of the mind the signs of disease are apparent, and how conduct might thus be affected. Even of a general paralytic, the mental phenomena—the mental sign of the disease—must be detailed. It will not be enough to say that he was a general paralytic. Indeed, it is because of its signs or symptoms that insanity is a disease which so often appears in courts of law, and the signs are there dealt with as the disease."

[As to this we would remark that, although unquestionably the signs and symptoms of insanity are to be carefully weighed and examined in medico-legal cases, inasmuch as it frequently happens that they of themselves constitute the evidence of the insanity, yet it cannot be too frequently insisted on by medical witnesses that insanity is a disease, and that the doings and delusions of the insane are the result of disease, for this is the point which we find, again and again, entirely ignored by the legal profession, who look on the insane as irresponsible or incapable much as they would minors or infants; and, although the measure of the capacity may be inferred sometimes from the delusions and behavior, yet it is not to be forgotten that we cannot demonstrate the whole of the insanity of an individual, or say that we have discovered one delusion, and are positive that no more exist. Recently a young lady, who had been for months under treatment, went away on leave of absence, apparently cured, and not till she had reached her temporary home did she betray a delusion concerning telegraph-wires which exists and has existed throughout. And this is too common to need any argument. So, again, with regard to special diseases, as general paralysis. The fact of a patient having died of this disease may at once decide a medico-legal question. We knew a

case where it was attempted to be proved that a hard-working solicitor, who eventually died in an asylum, was insane during the whole of his married life, though he did his work admirably, and concealed it from every one. But it was proved that he died of general paralysis, which ran a definite course in a few years, and was quite incompatible with the theory of insanity, having existed concealed for many years. Here the disease was of far more importance than any symptoms as we hear them sworn to by ordinary witnesses.]

Dr. Mitchell proceeds to divide his subject into three heads, and under the first he examines what is termed partial insanity and its bearings on testamentary capacity; and he narrates an illustrative case of one Simon Browne, which has already appeared in various works, medical and other. This man, a Dissenting preacher, was seized with melancholy, and for many years labored under a delusion that "the Supreme Being had annihilated in him the thinking substance, and utterly divested him of consciousness; that though he retained the human shape, and the faculty of speaking in a manner that appeared to others rational, he had all the while no more notion of what he said than a parrot." Yet the intellectual powers of his mind subsisted in their full vigor. His conceptions were clear, and his reasoning strong. His affections also were healthy and active, and in the affairs of life he conducted himself prudently. During the eleven years of his illness, he gave the best proofs of his intellectual ability, by writing several books which are still standard works. One was "A Defence of the Religion of Nature and the Christian Revelation," written in reply to Tyndall's "Christianity as old as the Creation." This he dedicated to Queen Caroline; and the dedication, which his friends found means to suppress, disclosed his delusion. He also wrote an "Answer to Woolston's Discourse on the Miracles of our Saviour," a "Disquisition on the Trinity," and compiled a Greek and Latin Dictionary. In short, he was a man most manifestly insane; he had a strongly-marked and fixed delusion ruling his conduct and disqualifying him from holding his office, yet "it left him able to write learned and argumentative treatises, to exercise his natural affections in a healthy manner, and to act rationally in the ordinary affairs of life."

The question is, Can a person in this or a similar state make a valid will—whether medical science and law are agreed as to this. On this point in the decision from which we have before quoted Lord Chief-Justice Cockburn said: "If it be conceded, as we think it must be, that the only legitimate or rational ground for denying testamentary capacity to persons of unsound mind is the inability to take into account and give due effect to the considerations which ought to be present in the mind of a testator in making his will, and influence his decision as to the disposal of his property, it follows that a degree or form of unsoundness which neither disturbs the exercise of the faculties necessary for such an act, nor is capable of influencing the result, ought not to take away the power of making a will, or place a person so circumstanced, in a less advantageous position than others with regard to his rights."

We are left, however, still to ask "whether there is in medical ex-

perience, a partial insanity of the mind which really leaves it free to act rationally in certain directions. Is not the mind of man an harmonious unity, which cannot be faulty here and sound there? May it not be said that, in our psychical organization, there is nothing partial, nothing fragmentary, and that between the different faculties there exists a principle of succession and anastomosis, which entirely prevents their detachment and isolation, so that, when a part falls, the whole must fall?

"These questions are not to be answered metaphysically. We must go into the world and see what actually happens both among the sane and the insane. We find striking contrasts exhibited among the sane in the exercise and energy of different faculties of the mind. Mental sanity is not equally complete in all its parts: its various faculties exhibit different degrees of health, even when to the faculties, as a whole, it may be quite proper to apply the term sanity. If we go further, we come upon the eccentricities, whims, oddities, and tricks of manner of the sane, phenomena differing only in degree, and not in kind, from insane delusions. Going further, we reach mental phenomena, which are spoken of as almost like insane delusions, yet away from this the man is still felt to be what other sane men are. Going a step further, still we find divergences from the average state so pronounced that we unconsciously find ourselves regarding them as states of mental unsoundness. Yet no observing man can have failed to note cases in which the disorder of the mind seems to show itself in one special direction, leaving the other faculties apparently without disorder. Legrand du Saule says that 'an insane person is not of necessity entirely absorbed in his insanity, and a certain number of his actions may bear the stamp of reason and free will.' Royer Collard, Delasiauve, Feuchtersleben, Hoffbauer, Pinel, Verdier, Casper, Castlenau, and Belloc, hold similar opinions.

"What we have now to do is to apply this doctrine to the making of wills. The testators, of whom we are at present speaking, are not held to be sane—they are, on the contrary, admittedly insane; but it is held that, though insane, they are still capable of doing certain things in a sufficiently natural manner, to make it fair to them, and not injurious to society, that these acts should be held as valid. Among these things is the making of a will. This is one of the things which some of the partially insane are held to be able to do in a valid manner. To what extent this is correct we have still to show."

Dr. Mitchell reminds us that it has been held by legal authorities that great powers of mind are not required in a testator. It is not necessary that he should view his will with the eye of a lawyer, or possess his faculties in as great a degree as he may formerly have done. This is of importance, as there certainly is in the partially insane an impairment of mental power. There is, also, another consideration. When the provisions of the will are colored by a delusion, all are agreed that it should not stand. And, even in cases where the signs of insanity seem clearly to take one direction and to refer to one subject, we should avoid setting strict limitations either to itself or to its influence over the other faculties. We believe some of the partially

insane should have the right of disposing of their property, but we do not leave the right with all the partially insane. *Each case has to be considered on its merits.* [The italics are our own, and we think that in this remark lies the gist of the question. To argue from the case of one insane person to that of another is always unsafe, for no two insane persons are alike, any more than two sane.] Either great oddity or unfairness in the wills of such persons, though the prominent delusion or delusions may not be disclosed in them, should always be held as very damaging to testamentary capacity, while, on the other hand, the fact that a will is rational in its provisions should go a very long way to establish competency where the insanity appears to have been only partial."

Dr. Mitchell then passes to the consideration of lucid intervals. This question, he observes, is of less practical importance in criminal than in civil cases, where it may assume a position of much importance. "What is meant by a lucid interval? It may refer to two states: 1. To clearly periodic intervals of lucidity in the course of an attack of insanity; and 2. To such remissions of the symptoms as may be regarded in the light of temporary cures. The first would resemble the intermissions in ague, while the second would resemble recurring bronchial attacks. In the first, the insanity is supposed to be merely slumbering; in the second, to be temporarily gone. But is it true that we have any forms of insanity with intervals of lucidity at all exhibiting the periodicity which occurs in ague? My answer is, 'None that I know of.' We have a large number of cases, however, in which well-marked remissions occur, which, for the time being, amount almost to a restoration to sanity, but which present themselves at irregular intervals, and are of uncertain duration. The intervals may be, it is true, more or less nearly equal in some instances—so nearly so as to justify our looking for an exacerbation at a particular time—but, notwithstanding this, we have to do here with something quite different from the wonderful periodicity exhibited in ague. These remissions resemble more nearly the intervals between such things as epileptic seizures or attacks of angina or gout. Even in the best-marked cases of what has been called *folie circulaire* in which periods of excitement, depression, stupidity, and lucidity, succeed each other again and again, there is nothing of the regularity and order which are exhibited in the periodicity of ague. Nor is it more correct to regard in this light those exacerbations of mental disease which coincide with, and are, in fact, due to, other periodic phenomena—such, for instance, as the menstrual discharge. In short, the so-called lucid interval resolves itself into a remission or disappearance of the symptoms, which, for the time being, more or less resembles a cure. A patient has a bronchial attack which yields to treatment, but we may know very well from his history, or from the cause of the attack, or from some concomitant, that he is almost certain to have other attacks. We may, perhaps, feel able safely to predict a long succession of them. Such a case, and not a case of ague, illustrates the lucid intervals of insanity. And just as we might have some doubts as to whether we should regard the patient, between the bronchial attacks, as cured, so there may be

doubts—doubts of exactly the same character—as to whether these lucid intervals in insanity should or should not be regarded as temporary states of cure. ‘What difference is there,’ Georget asks, ‘between a lucid interval and a cure? A patient who every year has an attack of mania, disappearing during some months, or has an attack of mania every two or three months, is he cured between the attacks, or has he only lucid intervals? We may admit,’ he goes on to say, ‘that a patient who recovers his reason for a month, only to lose it again, and so on, has nothing but lucid intervals, and that he who is well for at least six months in the year is cured, and may recover the rights he has lost. I believe we may even admit also that an individual who is insane for three-quarters of the year enters in the category of those who have only lucid intervals.’ This was all the precision that one of our best and clearest writers on the medico-legal aspects of insanity could attain in this matter. It follows, therefore, that, in describing a patient as being cured, or as being in a lucid interval, we are using terms arbitrarily chosen, and are not speaking with scientific precision.

“The next question is, whether the lucidity manifested in such intervals is ever complete. In most the restoration to reason is certainly only partial. The patient is not left what he was before the seizure. Even when excitement is gone and delusions have vanished, there will remain a weakened mental power, and a detectable but scarcely namable something in the operation of the mental faculties, and in the patient’s manner, which reveal instability of mental health and raise apprehensions as to the future.

“But may not the restoration to sanity, though not absolute, be sufficiently complete to justify the withdrawal of civil disabilities, and to restore the patient to civil rights? Legrand du Saulle, Fodier, and Langer, agree in thinking that during a lucid interval a patient may enjoy all his reason and be able to execute rationally a last will and testament.

“It is not necessary that the patient should be quite what he was; for, if he had never been worse than he is during such an interval, he never would have lost those rights the restoration of which he claims. What the perfection of reason may be it is difficult to say, but it is certain that patients, who are said to be in lucid intervals, stand at different distances from it. The mental state of a lucid interval is not one which is uniform, or which we can outline with sharpness, for we cannot even define the general states of sanity and insanity. It follows, I think, that all cases in which the question of lucid intervals is raised must be judged of separately—that is, each case must be considered on its own merits. No two cases will be alike. Each will have peculiarities, and these may refer either to the actual state of the patient, or to the history of a previous interval.

“Law and medicine, then, both admit the existence of the so-called lucid intervals; that is, of a marked remission in, amounting to a temporary disappearance of, the symptoms; and both agree that, during such intervals, there may properly be a resumption of rights and responsibilities. The medical question will relate to the character,

completeness, and sufficiency of the lucidity; and it will generally be as easy and as difficult to determine this as to determine when a cure should be pronounced; in the sense, that is, of a permanent cure. Cure replaces the patient, as a matter of course, *in statu quo ante*, and he is then 'treated precisely like any other person of sound mental health' (Casper, p. 232). But cures are often declared when no real cure has taken place, and the most complete of cures are too often nothing but long and undetermined intervals of lucidity, the tendency to relapse in mental disease being peculiarly great.

"In looking at lucid intervals, however, there are some medical experiences which it is useful to bear in mind, such as these: In the case of an idiot, imbecile, or confirmed dement, for instance, lucid intervals cannot of course occur, just as there cannot be a temporary or other cessation of lameness in a man whose legs are cut off. Again, if lucid intervals ever occur in the progress of cases of acute dementia, they are of extreme rarity. They are also very exceptional in the states called monomania; that is, in cases exhibiting one or two prominent fixed delusions of long standing.

"Again, the mere transition from agitation to calm does not constitute lucidity, for, after excitement has ceased, there may be as much mental derangement as while it lasted.

"There occur in some acute cases momentary exhibitions of lucidity, which are of good omen and may be the forerunner of convalescence, but these are too short to be of much practical value; yet even during them wise words may be spoken and wise acts done; but it would be inexpedient, as a rule, to deal with these as intervals of lucidity. Fortunately, we are not likely to be often asked to do so. If the act of such a patient were held to be valid, the rationality of the act itself would nearly always be the chief proof of the lucidity and the competency.

"The Roman law recognized the value of lucid intervals. 'If the lunatic has recovered his reason, or if he has made his will during a lucid interval, the will is held to be valid.' The Code Napoleon does not recognize it, but is so framed as not to exclude it. Article xc. says: 'To make a will, it is necessary to be of sound mind;' and the assumption is that during a lucid interval there is soundness of mind. The Prussian code enacts that 'persons who are only occasionally deprived of the exercise of their reason may make valid preparations for death during a lucid interval.' The Rhenish civil code, however, gives no privilege to the lucid interval. The English law makes a lunatic responsible, and gives validity to his acts during a lucid interval. A lucid interval being proved, a will is as valid as if the testator had never been insane. By such an interval, however, Lord Thurlow is reported to have said that 'he did not mean a cooler moment, an abatement of pain or violence, or of a higher state of torture, a mind relieved from excessive pressure, not an interval in which the mind, having thrown off the disease, had for the time being recovered its general habit.'

"I come now to another aspect of the question: If a person makes his will before he has been shown to be insane, it is presumed by the law

that he was sane when he made it, and, if any one attacks it, he must prove his insanity. But, if he has been shown to be insane before he made the will, the burden of proof is changed, and a person settling up a will must prove recovery. 'There does not appear,' said Sir W. Wynne, 'any authority or law to prove what the length of the lucid interval is to be, whether an hour, day, or month; all that is required is that it should be of sufficient length to do the rational act intended. If it is established that the act done was perfectly proper, and that the party was free from disorder at the time, that is sufficient.'

"The character of the will affects the establishment of a lucid interval. Sir W. Wynne observes that 'the strongest and best proof that can arise as to a lucid interval is that which arises from the act itself, which is the thing to be first examined, and, if it can be proved and established that it is a rational act rationally done, that is sufficient.' Brierre de Boismont tells us that, by a decree of the Court of Paris, 'the wisdom alone of the act confers on it a right of presumption that it has been done in a lucid interval.'

"Great weight should, I think, be accorded to the character of the will, and it will certainly not be too much if we receive it when it is rational, as very strongly supporting any other evidence of lucidity. It has been said that testaments are mirrors in which the makers are pictured, and there is much truth in this. Whether wise men generally make wise wills or not, it is of a verity that fools make foolish wills, when such wills are really their own acts. Therefore, when a will is a rational one, it should be received as strong evidence that its maker possessed a testamentary capacity. We cannot help regarding rational acts as evidence of an ability to act rationally; or, at least, of relevant competency."

In the volume of Reports of Guy's Hospital for 1872 there are some remarks by Dr. Wilks, upon various disorders of the nervous system, of the very highest importance and interest, from which a few extracts may be given:

Contraction and Spasmodic Affection of the Limbs.—"In the attempt to associate various derangements of the nervous system with corresponding morbid changes in the centres, we have, with something like precision, been enabled to fix the seats of maladies having their foundations in alteration of the sensory, motor, or nutritive functions; of course much has yet to be worked out, and a good plan for further investigation is to seize on some symptom and endeavor, by an observation of a series of cases, to track it to its source. One of these symptoms is spasm and contraction of the muscles. Now, at the present time very contrary opinions are held with regard to their immediate cause, and even the same author will associate spasmodic contraction of the muscles as occurring under totally different conditions, as, for example, when he says it is due to an over-excited state of the cord, or, again, to a destruction of it. It is probable that two different states may be intended under the denomination spasmodic action, but, where the cases are chronic, and evidently of the same nature, we cannot conceal from ourselves that very opposite opinions prevail. For instance, a case of chronic spasmodic contraction of the legs would be

considered by some an evidence that the spinal cord was healthy, but held in a state of permanent excitation; therefore, that the disease from which the patient suffered was a spinal meningitis, while by others such a case would be set down as one of chronic inflammation of the cord, or, to use the modern appellation, "sclerosis." The question can only be decided by many careful post-mortem examinations, for, with all our boasted advances in pathology, the facts are not forthcoming to allow us to give any thing like a satisfactory account of the morbid changes in the nervous centres.

"As regards spasmodic contraction we must admit that an over-excitation is sufficient for its production, for strychnia will cause it, as will also irritation of various peripheral nerves. In inflammation of the membranes of the spine a marked spasmodic condition is often seen. Here the source of irritation is in the nerves attached to the cord which pass directly to it. The same is seen in the epidemic cerebro-spinal meningitis. In many cases of chronic contraction and spasm of the legs a meningitis has been found, with the medulla spinalis quite healthy in the midst of the thickened membranes. It is probable that, in some of these cases where contraction is spoken of, there has been no permanent rigidity, but that an actively-spasmodic state could always have been excited. If so, it is possible that the one condition may be associated with a meningitis, while the other, or state of fixed contraction of the limbs, may signify a sclerosis. If we can separate the case of spasmodic contraction from that of permanent rigidity, the latter will have again to be analyzed, for it is probable that it may depend on more than one cause, since it has long been a question why a paralyzed limb should at one time remain flaccid and at another time become rigid. The late Dr. Todd, whose attention was specially directed to the subject, thought that the contraction of the limb depended very much upon the nature of the morbid process going on in that spot of the brain where lay the cause of the paralysis, and that the contraction was probably due to a cicatrizing process in the healthy cerebral structure around. A very different light has been thrown upon the subject by Charcot, who has discovered that the nerves themselves in the paralyzed limbs undergo a change; that they become hardened by the formation of a connective tissue among the fibrils, and that the muscles which they supply become, as a consequence, permanently rigid. I apprehend we must admit that, in spasmodic affections of the muscles or in cramps, the motor columns are in state of over-excitation, just as we say that in hyperæsthesia the sensory centres are over-active. For, if destruction of the cord produces akinesia and anæsthesia, so would over-activity of it result in hyperkinesia and hyperæsthesia. Then, as regards rigidity of the limbs, it might probably with truth be said that, if any reflex spasm can be produced, some portion of the cord must retain its integrity; therefore, in all probability, it is the surface of the cord and the issuing nerves which are involved in the meningitis. In a permanently fixed and contracted state of the limbs it may be equally correct that in some cases there is a hardening of the medulla, while in others there may be merely a cirrlosed condition of the nerves themselves."

Intermittent Tetany.—"In considering the spasmodic affections, we must not overlook the disease known as intermittent tetany. Like many other conditions which have only of late received a name, it has long been recognized and described, although it is the distinct appellation which has brought it formally before the profession. In a former volume of this work, Dr. Moxon reports a case of tetany, and alludes to the description of the disease, and the cases given by Trousseau. Dr. Broadbent also has stated that he is quite familiar with the class of cases known by this name. It seems to occur more especially in children, and in women after their confinements. In the latter it might often be overlooked under the guise of convulsions, although, if carefully studied, the symptoms would be seen to be peculiar, inasmuch as they are paroxysmal, and the spasms are of a tonic kind. The old term idiopathic muscular spasm of the extremities conveyed an idea of the affection, and was no doubt, used to indicate what is now styled 'tetany' or 'tetanilla.' It is a disease characterized by tonic convulsions, more especially of the legs and arms, occurring at intervals. The thumbs are drawn in, and sometimes the fingers flexed, although often rigidly extended in the form of a cone; the foot is stretched out and toes flexed toward the sole. The case, therefore, is unlike one of true tetanus, where the jaws and respiratory muscles are affected, while the extremities are free, except during the paroxysmal attacks."

Dr. Wilks narrates two cases, one of a child of three years, who had contraction of both legs, the legs being flexed on themselves and the thighs on the abdomen. The muscles of the arm were less affected, the fingers being extended and brought together in a conical form. Cold-water bandages afforded ease, and hydrate of chloral was given, in doses of ten grains, three times a day. The spasms gradually wore off. Another was a boy aged sixteen, who, while at school, was subject to severe attacks of spasm or cramp all over the body.

Contraction of the Limbs and Sclerosis of the Spinal Cord.—"The researches of Charcot have shown that contraction of the limbs is very often associated with a condition which has hitherto been styled chronic inflammation of the spinal cord, but to which he now applies the more distinct title 'sclerosis.' The advantages of a name of this kind are no doubt great, but at the same time it is apt to be seized upon by careless persons, and appropriated to a number of obscure disorders which seem to become clear by this christening process. Charcot means by the term sclerosis that condition where a new connective tissue is formed in the cerebro-spinal centres, destroying the nerve-fibrils, which, together with the new material, become converted into one dense mass. This adventitious matter may be met in various parts of the cerebro-spinal system. I myself have generally observed it to be of a whitish color when occurring in the substance of the brain, and of a whitish or gray color when met with in patches on the fourth ventricle or other free surfaces. At other times, instead of this new product being scattered, it affects one portion of the brain or cord alone, such portions being a strictly anatomical and physiological segment, as, for example, the antero-lateral columns of the spinal cord,

or the posterior column only. In the latter case the sclerosis is also called gray degeneration of the cord, and is the condition met with in locomotor-ataxy. If the antero-lateral columns are affected, the disease is spoken of simply as paraplegia. At the outset of the disease it has been stated by Charcot that 'tremor,' together with nystagmus or oscillation of the eyeballs, is a very common symptom, and in consequence the complaint has been confounded with paralysis agitans. As the disease proceeds, the trembling ceases and the limbs become rigid and closely drawn toward the body.

"That a chronic inflammation of the medulla, of the nature described, is constantly occurring, is well known; but whether it can always be diagnosed by the presence of such symptoms as I have mentioned, more particularly tremor followed by contraction, I would not say. In most cases of well-marked contraction of the legs, which have fallen under my notice, where a post-mortem examination has taken place, we have found a chronic meningitis rather than an inflammation of the medulla. We have in our museum the spinal cord of a man with the membranes enormously thickened, and in parts converted into bone, but the medulla itself not affected except immediately on the surface. In this case the man lay in bed for many months with his legs drawn up, his heels to the nates, and knees to the abdomen, and had great pain in moving them. He also had extreme excito-motility, which was a clear proof during life that a great part of the cord was left in its integrity. On the other hand, however, a former volume contains the report of a private patient of Dr. Gule's who had long-continued pain in the shoulder and arms, styled rheumatism, followed by weakness in the lower extremities. There were also cramps and twitchings of the upper extremities. These painful spasmodic twitchings were the most urgent symptoms. In this case softening was found in the lower part of the cord, but at the cervical enlargement the cord was indurated. Those who have followed Charcot in associating contraction of the limbs with sclerosis of the cord, describe cases where sensation in all its forms remained, and the excito-motor function was still perfect. It is impossible, therefore, to believe that, when this term is used, all the columns of the cord have been destroyed, and we therefore want more precise information on this point. It is probable that the anterior or antero-lateral columns were alone affected. We cannot exclude from the inquiry cases of hemiplegia as well as those of paraplegia, and then we might surmise that the summit of the cord in one of the central ganglia within the cranium was affected by the sclerotic process. I believe it, however, to be extremely rare for this contraction to go on in the arm and leg in the same way as in the leg alone; but in a case reported below such seemed to be the history. The rigidity of hemiplegia is of two kinds—that which occurs very soon after the attack, and that observed in the course of several months. In these latter cases it has been noticed in connection with all forms of disease of the brain; and in the most striking one which I have ever witnessed, where a man had his arm rigidly drawn across his chest for two years, one hemisphere of the brain was little more than a vacuum, from extensive softening. I cannot but think, there-

fore, that further researches will show that the causes of such contraction are to be found in the nerves of the limb itself; that the nerves, being disconnected with their centre, undergo a regenerative change throughout their course. If this be true, it is also probable that in the rigidity accompanying recent paralysis the nerve may be acutely involved, which affords an explanation of the pain which occurs on moving the limb. This explanation may throw light upon cases we have been discussing of chronic spasmodic action and contraction of the legs; it may show that in all such cases the nerves are involved, whether the disease be sclerosis or meningitis, and so a general conclusion may be arrived at, that, in all forms of contraction such as we have been discussing, the change in the nerve itself must be regarded as the immediate source of these symptoms. The opinion is strengthened by the remembrance of cases of infantile paralysis, and of cases of injury to the shoulder, followed by withering and contraction, where the cerebro-spinal centres are quite free."

• *Tremor and Paralysis Agitans*.—"It is said that an early symptom of sclerosis is tremor, a condition which has hitherto been regarded as paralysis agitans. Now, there is nothing remarkable in tremor being one of the first symptoms of an organic disease whose end is paralysis, seeing that it implies want of power. Between a well-knit, steady arm and a paralyzed one is the intermediate condition of a trembling or shaky one. This is seen every day as a simple result of enfeeblement or exhaustion, where, after a fatiguing walk, the gait would be unsteady and the arms trembling. In paralysis agitans of old people we suppose that the centres are undergoing decay, that the *vis nervosa* is deficient, and that the muscles do not preserve their tone, from an absence of nerve-current. In fatigue the same thing occurs, as a temporary condition, from exhaustion of the cord. In the latter case no tremor would be observable unless the will were attempted to be exercised on the muscles; whereas in true paralysis agitans the movements continue even when the limb is rested. This would seem to remove it from true paralysis, or where power is wanting, for in the case of mercurial poisoning the cerebro-spinal centres are weakened, in conjunction with all the tissues of the body, and here no tremor occurs while the patient is at rest. In all cases of this class, where, as soon as voluntary effort is attempted, a shaking occurs, we may suppose an enfeebled state of the nerve-centres, and a tendency to paralysis. It is not unreasonable to suppose that it may occur in connection with regeneration of the spinal cord. It is on this theory that chorea, especially when affecting one side, is thought to be due to embolism of the capillaries of the central ganglia of the brain."

Local Paralytic Affections.—"Another subject of great interest is the cause of spinal diseases. These, as in the case of the brain, may be of two totally different kinds in respect of their mode of origin, according as they are extrinsic or intrinsic. The former are accidental, and may arise from extension of a caries, or of a morbid growth inward, whereas the latter arise from causes which act directly on the nervous system, in a constitution often predisposed to their development. Of the former class, besides those cases which are produced

directly from the inroads of some local disease, there are those which arise from a general concussion of the nerve-centres, in consequence of severe injury; and there are, again, those instances of spinal disease which apparently occur from the gradual progression of morbid action along the nerve-trunks. Of the latter or idiopathic class, we have cases arising from cold, exhaustion, sexual excesses, or intemperance in drinking. All these questions of cause must be rapidly considered when we are called to form an opinion as to the nature of any individual case. First of all, there is often a great difference in the nature of the symptoms which will lead us to the diagnosis. In the case where the cause of spinal disease is external and accidental, the symptoms point to one spot in the cord as the seat of their origin; while, if the affection be intrinsic or form within, the morbid action having involved a large extent of the medulla, the symptoms would be less confined. We are guided by what is observed in experiments on animals or in injuries to the spine, where, if the medulla is secured at any spot, a paralysis of function and sensation occurs below this point, while the reflex function remains intact. When, therefore, a patient comes before us with paraplegia, and the excito-motor function remains, we can at once say that the cord is diseased at a certain spot on a line with the anæsthesia, while it is healthy below. In the last three cases where these symptoms existed I was led to say that the disease was accidental, and not a true nervous affection, and the result showed a caries hydatid, and eroding aneurism, respectively. In cases of idiopathic myelitis or meningo-myelitis, the morbid action is not likely to be confined to one spot, or, even if beginning locally, will generally be found to extend itself long before a complete destruction of nerve-tissue occurs at the original seat of disease. Thus, cases may present a partial paraplegia of motion or sensation, combined, perhaps, with ataxic symptoms, and the arms be involved as well as the legs, or even the whole length of the cord may be implicated, as shown by paralysis of the cranial nerves, and yet at this time the patients can still walk about. In speaking of cases of inflammation of the cord which occur from within, I include those which may have an exciting cause in cold or injury, if these produce their effects immediately on the medulla itself. Thus, I have been seeing lately a lady who, after getting wet through, was obliged to ride home in an open carriage on a very cold day. She soon began to be ill with flying pains about her, and these persisting, soon made it clear that she had a meningitis of the cord; so that at the end of some weeks she was paralyzed in the legs, partially in the arms, with severe pains in all the limbs, and at the same time had optic neuritis, which destroyed for a time the sight of the right eye. These symptoms continued for many months, when recovery gradually took place. Some of the most difficult cases on which to form an opinion are those where disease is for a time limited to one spot of the spinal cord, and makes itself known only by paralysis of one limb. Indeed, in such cases of limited paralysis it is often impossible to say with certainty, when they first come before us, whether the cause is central or localized in the nerves. And even then another question often arises,

whether an affection which is in the first place purely local and confined to the nerves, may not extend to the centres. Well-known experiments on the roots of the spinal nerve have shown how a nerve depends for its healthy state on the integrity of the centres with which it is connected, and also how a morbid action may be propagated backward from the fibrillæ of a nerve along the medulla, taking the course of a given anatomical track. It has thus been thought that an injury to a limb, involving a nerve, may secondarily induce disease of a centre, and consequently that a paralysis, having first of all a local cause, may soon come to own a general one. Some years ago the case of a young man, under the care of Dr. Barton, caused much discussion between himself and his colleagues on this very point. He had received a severe injury to the arm, causing destruction of the soft parts, and the limb became useless. Subsequently he had weakness of the other arm, and afterward of the legs, so that he was wholly paralyzed. After death there was found a chronic inflammation of the cord. Of course in such a case the explanation is open to the objection that at the time of the accident he might have received some injury to the cord itself in the neighborhood of the brachial plexus. It is evident, then, that much work has yet to be done with respect to the relation which the morbid processes of the centres have to the nerves with which they are connected, and the fact of the optic nerve being inflamed in association with affection of the brain may be only an example of a closer intimacy than has been anticipated between the centres and their offshoots. As before said, the various forms of contraction and spasms of limbs may be due to a morbid state of the nerves rather than of the centres, owing to the concord of morbid action; and if also pathological processes are propagated from the nerves to the centres, it may show that a more direct study of the diseases of the nerves demands our attention. Certain it is that forms of local paralysis are constantly coming before us where we can assume nothing else than that the nerve is involved. We know that from an injury to a limb a paralysis with wasting may result; and consequently, whenever we meet with this latter condition, we may assume that the nerve has been primarily affected. We speak of sciatica and tic as painful affections of nerves; and therefore, if anæsthesia and hyperæsthesia may arise from a morbid condition of a nerve-trunk, there seems to be no reason why spasm on the one hand, or paralysis on the other, or akinesia and hyperkinesia, should not own a similar local cause. Indeed, the old surmise, that progressive muscular atrophy might be due to a primary affection of the motor nerves, has never been disproved."

Syphilitic Epilepsy.—"The character of the fits will often enable us to declare their nature—whether they depend, for example, on such causes as simple epilepsy, syphilis, or albuminuria. In such cases any departure from the usual symptoms of a true epileptic attack should excite our suspicion as to its nature, and suggest some special exciting cause for it. In the 'petit mal' or 'grand mal,' the loss of consciousness exists but for a minute or so, and after the attack the patient slowly recovers, and remains well until the next fit. But in

albuminuria, or epilepsy, arising from a local cause, as syphilis, or in renal and syphilitic eclampsia, as the fits might be called, the paroxysms occur in rapid succession, and coma may exist in the intervals: there may also be convulsion without loss of consciousness, or the attack may be accompanied by paralysis of one side. These constitute a certain class of symptoms which at once suggest to my mind a local cause, as syphilis, even before I obtain the history, more especially if there has been a succession of fits occurring at short intervals, accompanied by a partial hemiplegia. Under these circumstances the disease may be considered due to a syphiloma between the membranes and brain, and if this be situated in one hemisphere, as is usually the case, the irritation causes the convulsion to be unilateral or predominant on one side, and to be followed by a partial paralysis on that side. At the same time, as only one hemisphere is involved, the consciousness sometimes remains. I had observed this peculiarity on several occasions before I was aware that Dr. Bright had called attention to the circumstance in the first volume of these reports, in reference to a case which in all probability was syphilitic. The case was that of Philip D., admitted under Dr. Bright's care July 1, 1835. He had syphilitic scars upon him, and was admitted for fits. During these attacks the right arm was convulsed, and remained afterward weak, while the man appeared to be sensible during the whole of the paroxysm. Dr. Bright gave it as his opinion that the fits were due to local disease of the left side of the brain, involving the corpus striatum, and the post mortem showed what was, no doubt, syphilitic deposit on this side. Dr. Bright says, in reference to the case: 'My reason for supposing that the epileptic attacks in this case depended rather on a local affection, than on a more general state of cerebral circulation or excitement, was the degree of consciousness which was observed to be retained during the fits; for, although we meet with great variety in this respect, yet, in two cases which have occurred to me, the fact of the patient generally remaining conscious has been a remarkable feature, while in each the injury on which the fits depended was of a local rather than a constitutional or a general character.'

There are some remarks in the July number of the *Journal of Mental Science*, concerning the case of Mr. William Charles Minor, which we quote as supplemental to those we gave in the last number of this JOURNAL, upon insanity and homicide, as illustrated by various recent trials. The efforts of the prosecuting counsel, Mr. Denman, were evidently directed to prove that there was no discoverable or demonstrable connection between the prisoner's delusions and the act which he committed. For, if a man, knowing in other respects the difference between right and wrong, have the maddest delusion which madness can imagine, and if he do murder, and if no direct connection can be traced by others between the delusion and the murder, then, according to the dicta of English judge-made law, the man may righteously be put to death, as an example to other madmen. To absolve him from responsibility, the criminal act must be "the immediate, unqualified offspring" of the delusion. If not, though he would be held incapable of conducting his own affairs, he would be considered an-

swerable for the act. In fact, "the good old rule" of English law, that an insane person may be a proper object of punishment, is as binding now on English judges as it was generations ago. The influence of the delusion upon the act must be direct and positive; for if an insane person, under a delusion that some one has inflicted an injury upon him, were to kill that person, he would unquestionably be amenable to punishment as a murderer. It is the duty and within the capacity of a murderer to know that it is wrong to revenge evil for evil, and that it is right to bless those who persecute and despitefully use him; and if he knows this of a real injury, he must be assumed to know it of an injury which he is under the delusion that he has sustained. The unsound mind, being in no wise incapacitated from full healthy function, by the disease of which the delusion is a symptom, should entirely isolate its delusion or delusions, just as prudent persons isolate a case of small-pox or other infectious disease, and should not allow it to infect the feelings, thoughts, and acts. With this exception, however, that if the insane person makes a will, or does any other civil act to the prejudice of another, under the influence of a delusion that he has been injured by him, his delusion will be assumed to have infected his conduct, and his act will be voided by law. He may make a will under the influence of bad feeling springing from a delusion, and he will suffer the penalty of having his act declared null; but if he does murder under the influence of an exactly similar feeling, springing from an exactly similar delusion, his act will be declared valid, and he will get the benefit of being hanged!

"Such being the doctrine of English legal psychology, it was plainly somewhat hard upon Mr. Denman that the judge interposed so decidedly, and, by putting a stop to his ingenious efforts to show that there was nothing at all in evidence to connect the prisoner's delusions with the particular act of homicide, or with any homicidal tendency, prevented him from arguing that William Charles Minor ought properly to be hanged, as an example to other madmen, and to deter them from the perpetration of a like offence against law. The only medical witness examined stated distinctly that, in his interviews with the prisoner, he had never discovered 'any thing to connect the act of killing Merritt with the influence of his delusions.' Moreover, 'on every other subject he was quite sensible, and capable of understanding what was said to him, and of holding rational conversation, and capable, upon matters not within the scope of his delusion, of distinguishing right from wrong.' So far as the evidence went, it appears, then, that there was a miscarriage of law, and that the prisoner ought to have been convicted and hanged." It may be hoped, however, that the safety of society will not be much endangered by the issue of the case, more especially as the miscarriage of law was not a miscarriage of justice; on the contrary, the strict administration of the law would, without doubt, have been the perpetration of great injustice.

The next observation made by the writer refers to a saying of the lord chief-justice in his directions to the jury, on which we have already commented in the last number of this JOURNAL. "If the evidence satisfies you," he said, "that the prisoner at the time he committed the

act was not in a state to distinguish right from wrong, and was not capable of controlling his actions, then he would not be responsible for the act he committed, and you would find a verdict of not guilty, on the ground of insanity." Here, again, we may take up an argument on behalf of law against justice. The capability or incapability of controlling actions has no part in the legal criterion of responsibility—it is not in the bond. Why, then, did the chief-justice introduce it? If the prisoner was in a state to distinguish right from wrong—if he knew that it was unlawful to commit murder—he was legally responsible, whether he was capable of controlling his actions or not. True it is that an insane person may know right from wrong, and yet may not have the power to control his actions, but the law takes no cognizance of such a mental condition; it is a freak or blunder of action which the law cannot recognize. To introduce the question of capability of control into the summing up in this case was, therefore, to give the jury an excuse for acquitting on the ground of incapability of control, by reason of insanity, a person who was capable of distinguishing right from wrong. The jury seem to have taken advantage of this outlet. It was evident that Minor was capable of distinguishing right from wrong, and, although no direct connection was shown between his delusion and the homicidal act, it was also evident that the latter was the uncontrolled and uncontrollable act of a madman. The legal custom of attempting to trace the working of an unsound mind, and of distinguishing between its healthy and unhealthy action, was more honored in the breach than in the observance.

"There was a sufficient cause of mental derangement in the stroke which the prisoner was said to have had, and there was distinct evidence of such derangement furnished by the fact that he had been the inmate of a lunatic asylum, and by the delusions he evinced.

"If we were to draw any medical lesson from the case, it would be a lesson of caution with regard to patients who have delusions of persecution. They are often dangerous to others, and it is not necessary to impress upon their friends how great a risk is run if they are not put under some kind of supervision. 'The monomaniac, who has delusions that he is watched continually, or otherwise persecuted, must always be deemed dangerous to others; for, at any time, he may become so impatient of his sufferings as to make a fatal attack upon his persecutor.' The mischief of the matter is, that these patients are often so remarkably acute and sensible on all matters outside the sphere of the delusion, that it seems a pity to meddle with them, and cruel to deprive them of their liberty; however, they are cunning, and, if they perceive that their delusions have brought them into trouble, they will sometimes conceal and deny them, in order to get rid of supervision. After they have succeeded in getting free, they are not unlikely to bring an action against, or otherwise annoy, those who have had any part in subjecting them to restraint."

The report of the Edinburgh asylum is, as usual, interesting and instructive. We give Dr. Skae's remarks on dipsomania: "I would now strongly urge the clear and certain diagnosis which exists between the dipsomaniac and the self-indulgent drunkard. In the former case a disease of the nervous system is present, often hereditary and dis-

What one regrets with regard to this scheme is the inequality of the attempt to classify the cases upon the constitutional condition accompanying the mental impairment. Dr. Skae says of it: "It may be considered a *multum-in-parvo* system, as, in merely designating the form of insanity under which a patient labors, it gives a large amount of information as to the nature of his case, and the kind of treatment most suitable for it. Thus, when it is said that a patient is affected with syphilitic insanity, the attention of the psychological physician is at once directed to a certain group of symptoms; he knows that most probably certain precautionary measures will be necessary to guard the patient from the various destructive impulses which are frequent symptoms of mental disorders of this class; and that he may alleviate if not cure his patient's complaint by the judicious use of certain remedies. But, if, after the old method, the patient is described as laboring under melancholic or paroxysmal acute mania, no information is afforded or method of treatment indicated, except that which, indeed, can hardly be called curative treatment, viz., the lavish use of soporific medicine."

If Dr. Skae could give of every form of insanity as useful a designation as is syphilitic insanity, his remarks would have more weight, but to our thinking, melancholia, or paroxysmal acute mania, conveys as much indication of the patient's state and the treatment required as his own idiopathic sthenic mania and melancholia. Under the head idiopathic insanity, mania, melancholia, monomania, and dementia, are grouped one hundred and thirteen out of the two hundred and sixty-nine cases admitted, and what are these but the divisions of the old method?

From some valuable remarks contributed by Dr. Wright, Dr. Skae's assistant, we extract the following concerning the epileptic temperament when concerned in the production of insanity: "Insanity in the cases of five females has been attributable to epilepsy. Cases of this kind may differ in gravity throughout a wide range—from the outburst of irritability connected with the form of the complaint known as *petit mal*, to the tempest of homicidal passion, in which the influence of the diathesis seems to intensify the patient's fury and promptitude in the accomplishment of her designs; from the temporary dulness following a slight fit to the state of hopeless dementia into which the long-continued epileptic sinks at last.

"There are, I believe, many cases in which insanity depends upon the epileptic temperament, and yet the patient for long may be free from the convulsive attacks characteristic of the general nervous disorder; the diagnosis of an epileptic origin in such cases rests on the form of mental disorder displayed. The attacks of insanity are extremely sudden in their invasion; the patient may remain well for some time, with the exception of a certain irritability of the mental functions, when suddenly, on the supervention of her malady, she breaks into the most violent passion, and does not scruple to inflict severe injury on the object of her animosity.

"Such a case is at present in the house. This girl (she is now eleven and a half) first became insane some three years ago, and her insanity was ascribed at the time to the effects of a severe fright; the

symptoms of mental ill-health bore all the characteristics above mentioned; she was very irritable and would fly into sudden fierce passion, in which she used the most indecent language. It had for some time been suspected that her insanity was epileptic in its nature; and to justify the diagnosis, a short time ago, after one of these outbreaks, she had a very severe epileptic fit, followed at short intervals by others; since then, at intervals of different duration, she has had several such convulsive attacks.

"In the case of another patient, no fit has as yet occurred, but the symptoms of her complaint are the same; and, what is curious, almost invariably her sudden excitement is preceded by a passion of violent agitation, a frequent precursor of the ordinary epileptic fit. She screams, and entreats that she may be allowed to go and see her mother, and on several occasions lately has complained of a feeling of pain and uneasiness in one side (the left) before the excitement came on, which in its nature very much resembled the epileptic aura."

II.

PHYSIOLOGY AND PATHOLOGY OF THE BRAIN AND NERVOUS SYSTEM.

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1.—*The Group of Myopathies of Spinal Origin—Infantile Paralysis.* (A Clinical Lecture by M. CHARGOT, at la Salpêtrière, in July, 1870. *Revue photographique des Hôpitaux de Paris*, No. 1.)

GENTLEMEN: I wish to direct your attention to a group of diseases, which I propose to describe under the name of *spinal myopathies*, or *myopathies of spinal origin*.

A trophical lesion in the muscles, of greater or less extent in breadth and depth, is a constant characteristic in every variety of this group; and in this chiefly do we find their most important clinical symptom. On the other hand, these muscular affections seem always to be accompanied by an alteration occurring preëminently in, if not entirely confined to, certain elements of the gray substance (i. e., the apparatus of nerve-cells called motor), which, as you know, is situated in the anterior horns of the gray matter of the spinal cord.

Before entering upon the special study of the several affections composing this group, allow me to present a few preliminary details, necessary in order to develop the general characters I wish to describe to you.

Although the central gray substance of the spinal cord occupies, relatively, a circumscribed space, nevertheless, in a physiological point of view, it is the most important portion of the spinal centres. It is sufficient to remind you that this central cord of gray substance must be passed in the transmission of sensitive impressions, and that the voluntary and reflex motor impulsions have of necessity to pass through the gray substance; so that, if this track were severed, the accom-

plishment of all these functions would be at once rendered impossible. But, to-day it seems demonstrated that all parts of the gray substance are not indiscriminately acted upon in the execution of these varied functions. It is possible to establish several regions, several distinct departments, in this limited and circumscribed space in the centre of the spinal cord, which is occupied by the gray matter. For example, M. Brown-Séquard, followed by M. Schiff, separates physiologically and very clearly what he calls the central gray matter and the horns of the gray matter. The former, together with the posterior horns, plays an important rôle in the transmission of sensitive impressions: while the anterior horns are especially devoted to the transmission of motor excitations, and have little connection with the sensibility.

These results, gentlemen, based upon physiological experiments, are confirmed by pathology. Disease can at times produce, far better than the most skilled physiologist, those changes which affect separately the various regions of the gray matter. This is very true of the diseases we are about to study. They are each occasioned by a lesion confined entirely or almost entirely to the anterior horns; and in consequence, although the transmission of sensitive impressions is not at all modified, it is very unusual that the motor functions are not seriously interfered with. This absence of any change in sensibility is a symptom which enables us to distinguish the affections of this group from the various forms of myelitis, which we have already studied, and which, like these, are also located in the central gray matter. In the various forms of central myelitis the inflammatory lesion extends indiscriminately into all the regions of the gray matter; whence it happens that sensibility and motion are of necessity simultaneously affected. In the spinal myopathies, on the contrary, at least in the typical cases, only the motor functions and the nutrition of the muscles are disturbed, without any other complication.

While we are comparing myelitis, properly so called, with the spinal myopathies, permit me to allude to the following points, which belong to the former and not to the latter: In the spinal myopathies, the muscular affection is limited to the muscles of animal life, and particularly to the muscles of the extremities, the trunk and head not entirely escaping, however. The functions of the bladder and rectum are usually intact. It is uncommon, contrary to what occurs in ordinary myelitis, in the progress of the spinal myopathies ever to meet with crusts, or other indications of disturbed cutaneous nutrition. Finally, in the spinal myopathies are absent the exaltation of the reflex properties, the various forms of spinal epilepsy which manifest themselves in certain kinds of myelitis, the permanent contraction which arises in, and constitutes one of the symptoms of, the sclerotic diseases of the white antero-lateral columns arrived at a certain point of development.

Upon the whole, gentlemen, the lesions of the muscles of animal life (recognizable in the motor paralysis, and in the greater or less degree of atrophy) constitute, as I have already told you, the predominant clinical characteristics of the diseases we are about to study together.

But, just here, it is necessary to point out an important distinction. Sometimes the motor feebleness, existing in a certain number of muscles, or groups of muscles, is the first symptom which can be recognized. The muscle is at first paralyzed; the motor functions becoming more or less completely destroyed, and the structure of the muscle seeming to be only secondarily altered. At other times, on the contrary, the affected muscles are, from the very commencement, the seat of considerable trophic disturbance; and in these cases the motor paralysis seems to be in proportion to the degree of atrophy which the muscle has undergone. These cases are the two extremes, connected by many intermediate cases; for often—most frequently, perhaps—the diseased muscles are paralyzed and atrophied at the same time, and besides, are more or less deeply changed in structure.

The affections we propose to unite under one head have hitherto been quite separated in nosography, as though they were radically distinct diseases. Let it suffice, by way of example, to cite the infantile spinal paralysis, the general spinal paralysis, recently described by M. Duchenne (of Boulogne), and which has not yet been allowed a place in the classic lists, the glosso-labio-laryngeal paralysis, and the progressive muscular atrophy. I hope to show, in the comparison I am about to attempt, that these possess characteristics in common, which have remained until to-day misunderstood.

But, gentlemen, it is time to turn from these preliminary considerations (which are too general no to be somewhat vague), and to enter upon the analysis of the facts. We shall select as a type the peculiar disease commonly known under the name of infantile paralysis. This disease is indeed one of the most remarkable of the group. Its specific characters appear so strongly pronounced, that infantile paralysis may be taken as a classic disease. And, if we shall succeed in developing before you the most salient points of its clinical history, the remainder of our task will be easy of accomplishment. You are not unaware that the disease in question belongs to a certain period of childhood. It occurs most frequently between the first and third years of life. After the fifth year it is rare, after the tenth year it is very unusual. But, gentlemen, it is important to remember that there may be developed in the adult, even in middle life, an affection differing in no essential particular from this infantile paralysis; so that, by the side of the spinal paralysis of infancy, we must make room for a spinal paralysis of adult life. This is a point to which M. Duchenne (of Boulogne) has called attention, and which other observers also have noticed. I wish briefly to describe the symptoms which characterize this affection; and, for the sake of clearness, will recognize two periods of the disease:

First Period.—The manner of invasion of infantile paralysis is very remarkable. The disease announces itself abruptly, suddenly, usually ushered in by an intense fever, with or without convulsions, or other cerebral symptoms, occasionally with slight muscular twitchings. This initial fever is present in the large majority of cases, but sometimes it is altogether absent. However this may be, the paralytic symptoms appear from the commencement, and, by the end of the first or second

day, have acquired their maximum in extent and intensity. The paralytic symptoms have a great variety of locations: sometimes there is complete, absolute paralysis of the four extremities, or of three of them; or, only one of the inferior or superior extremities is affected. At other times, but very rarely, the two superior extremities exclusively are seized; or the paralysis may be located alone in the inferior extremities, simulating paraplegia. You observe, then, that we have here a paralysis, complete, absolute, with flaccidity of the extremities, with abolition or diminution of reflex excitability—without (and this is a point upon which I greatly insist) any sign of diminished sensibility or of necrosis of the integument, without any functional trouble in the bladder or rectum.

Does formication, or any pain, exist in the beginning, indicating at least a temporary participation of the central gray matter? Several observations of MM. Duchenne and Heine, upon children old enough to give information in regard to these points, tend to establish the fact that they both exist. That which occurs in the adult in similar cases argues in the same direction. This is, however, usually a momentary and accessory phenomenon, while the absence of any well-marked alteration in sensibility, in contrast with a motor paralysis so complete and absolute, is one of the most striking characteristics of infantile paralysis.

Still another sign. At an early period in the disease the electro-faradaic contractility in a large number of the paralyzed muscles is reduced to a minimum; and, in many of them, in appearance at least, it is entirely destroyed. This important fact was recognized by M. Duchenne in several instances upon the fifth day; but it is generally observed upon the seventh or eighth day. And, just here, I recall to you what I said not long since, that, according to some authors, the galvanic contractility can bring muscles into play when faradization no longer avails.

These, gentlemen, are the most prominent symptoms in the first period of infantile paralysis. Allow me to recapitulate them in a few words: 1. The sudden invasion of the motor paralysis (which from the very commencement attains its maximum of intensity), following a greater or less degree of febrile action, or else appearing without any fever. 2. Immediate diminution or even apparent abolition of faradaic contractility in a certain number of the affected muscles. 3. Absence of any considerable disturbance of sensibility, absence of paralysis of bladder and rectum, absence of cachars, or other indication of disturbance in the nutrition of the skin.

Second Period.—The second period of infantile paralysis is introduced by the commencing retrogression of the symptoms just enumerated. It begins from the second to the sixth month from the origin of the disease, sometimes earlier, sometimes later. Several months are required for its full development—in some cases, according to Volkmann, even six months. At the end of eight or ten months from the commencement of the disease (the time when this retrograde period is complete), those muscles which have not regained their functions may be regarded as injured beyond hope of recovery. As a rule,

all of the muscles do not regain their tone. In the ordinary cases, there are always some muscles (for example, those of a single region, or of an entire extremity), in which the lesions continue to develop for some time longer, and then remain permanently, presenting to the observer a series of phenomena well deserving special attention.

(a.) It soon becomes evident that atrophy has taken place in those muscles in which the faradaic contractility has not reappeared. We are not always able accurately to estimate the extent of atrophy, for it is often marked by the accumulation of adipose cellular tissue. This atrophy is one of the most salient points in the diagnosis of infantile paralysis; and it seems to be developed more quickly in this disease than in lesions of the mixed nerves, where, however, it also very rapidly occurs. According to M. Duchenne (of Boulogne), it is already by the end of the first month very apparent; and cases sometimes occur where it is present from the very origin.

(b.) *Arrest of Development in the Osseous System.*—The arrest of development in the osseous system was first observed by M. Duchenne (of Boulogne), and, after him, by M. Volkmann. The atrophy of the bones is never necessarily proportional, in degree or extent, to the muscular atrophy and paralysis. For instance (according to Duchenne), in one case, an extremity attacked by infantile paralysis may have lost the majority of its muscles without becoming more than two or three centimetres shorter than its fellow; while, in another case, the diminution in length of a paralyzed limb may be as great as five or six centimetres, although the muscular lesions in the latter case remain localized in one or two muscles, and admit of very prompt recovery. On the other hand, M. Volkmann has observed cases of considerable shortening in the diseased limb in children, who, on account of the slight degree of change in the muscles of the feet, and of the limited extent of the essential deformities, scarcely limped at all, and were able to be upon their feet during the greater part of the day. He says he has even met with four or five cases of infantile paralysis, terminating at the end of a few days in complete restoration of the functions of the muscles, which, nevertheless, have been followed by lesions in the nutrition of the bones, which continue during life. It would be difficult to find more perfect examples than these, by which to establish the direct influence of the lesions of the central nervous system upon the osseous structures, because, in such cases, it is impossible to appeal to the effect of a prolonged functional activity.

(c.) *Coldness of the Extremity.*—Still another symptom, which is worthy of mention in connection with the preceding, is the permanent coldness, often very marked, which exists sooner or later in the affected limb. As is the case with the atrophy, so this symptom seems to be more pronounced in infantile spinal paralysis than in any other form of paralysis affecting the extremities. This is, perhaps, the proper place to observe that, at the autopsy in cases of this kind, you find, in addition to the atrophy of the muscles and bones, a striking diminution in the calibre of the vascular trunks. At times this coldness is observable at a very early period—a few weeks only after the beginning of the disease, or, it may be, even earlier.

(d.) A final characteristic is furnished in the deformities produced in the paralyzed limbs as a result of the predominance of force in the muscles which have remained healthy, or have recovered their tone. The pathogenesis of these deformities offers no obscurity. We know that the atrophy does not extend uniformly over all the muscles of an extremity. It predominates in certain muscles and groups of muscles. The antagonists of these must impose abnormal positions upon the limb, corresponding to the direction of their movements. These deformities begin to appear at about the eighth or tenth month. It is thus that the club-foot of infantile paralysis is developed—the paralytic club-foot *par excellence*, and which in a vast majority of cases assumes the form of *varus equinus*. The laxity of the ligaments becomes so great that the limbs may be placed in any position whatever, resembling very much the limbs of a puppet. This extreme laxity of the joints, in conjunction with the other symptoms, but particularly with the coldness of the extremity, enables us always to distinguish the club-foot resulting from infantile paralysis, from congenital club-foot, even when all history in regard to the development of the case fails us.

From the moment the lesions have become stationary in certain muscles, the disease may be said to be arrested in its progress; and henceforth it is only a question of a more or less troublesome infirmity, which, according to Heine, does not seem to have any influence upon the duration of the patient's life. In support of this statement I can show you to-day an old woman in this hospital, in whom, at the age of sixty-five years, may be seen the most striking evidences of this disease, from which she suffered when only five years old.

Such are the fundamental characteristics of infantile spinal paralysis, considered in its regular course of development. Sometimes, however, irregularities occur in the natural evolution of the disease, which it may be well also to notice. For example, there are cases, in which, after the fever, the paralysis, instead of attaining its greatest degree of intensity, all at once develops progressively during several days, or even weeks. In some cases, during the period of retrogression, periods of repose occur, or even at times of progressive action. But I will not dwell longer upon these anomalous facts, which are, moreover, only rarely encountered. I was unwilling, however, to pass them by entirely in silence; because, according to my opinion, they may serve as a bond of union between infantile spinal paralysis and the other diseases of the group.

I am now going to attempt to bring before you the lesions of infantile paralysis which have recently been established, and which explain the remarkable collection of symptoms which has just been presented to you. We will first take up the lesions of the muscles, and afterward those of the nervous system:

1. *Lesions of the Muscles.*—I shall be brief in regard to the changes occurring in the muscles, for this portion of the subject requires still further investigation.

(a.) *First Period.*—It is especially in reference to the first phases of the disease that our knowledge of the histological changes in the

muscles fails. During this period, according to our present knowledge, the greater part of the primitive fibres undergo simple atrophy without fatty degeneration. Microscopic examination discovers a large number of fasciculi of very small diameter, preserving, however, their normal striation, and presenting no traces of fat-granules—other fasciculi, in large quantity, interspersed among the foregoing, enclose, at different points, masses of sarcolemma. A third variety of fasciculi, commonly in very small quantity, have lost their situations, and present the various degrees of a granular fatty degeneration. But this latter variety, I repeat, is very rare. It seems universal that the irritative lesions predominate over those called passive. We shall soon see, contrary to the generally received opinion, that this same characteristic is found in progressive muscular atrophy of spinal origin.

The lesions in question seemed to be developed early in the disease. According to M. Duchenne (of Boulogne), M. Damaschino has recognized them, three weeks after the beginning of the disease, in a fragment of muscle obtained by means of the *emporte-pièce*. By this same means MM. Volkmann and Steudener also have been able to study the muscles at a time very near the beginning of the disease, and have recognized the same changes. These later authors describe, besides, an hyperplastic condition of the connective tissue, not mentioned by the other observers, and which we have discovered, very well pronounced, in cases of long standing.

(b.) *Second Period*.—If we study the affected muscles at a time remote from the commencement of the paralysis (as we have often studied them at la Salpêtrière), we find that, as a rule, to the lesions described above, all the evidences of the substitution and superposition of fat have been added. Masses of fat granules and globules are collected within the sheaths of the sarcolemma, taking the place of the primitive fasciculi, which have entirely disappeared, or are found only in fragments. On the other hand, fat-cells are massed together upon the outside of the sheaths of the sarcolemma in the interstices of the primitive fasciculi. This interposed adipose tissue is sometimes sufficiently abundant to distend the aponeurotic covering, so that, as M. Laborde has shown, the volume and outline of the muscles may be to a certain extent preserved, although the greater portion of the primitive fasciculi have disappeared. There are cases (of which I have seen one) where the superposition of fat has been so great as notably to increase the volume of the muscles; thereby accurately reproducing the appearance observable in the last stages of the affection, described by Duchenne (of Boulogne), under the name of pseudo-hypertrophic, or myo-sclerotic paralysis. It is important for you to be well informed upon this point, for soon I shall have occasion to show you that, in spite of this analogy of secondary symptoms, infantile paralysis differs essentially from pseudo-hypertrophic paralysis (*atrophia musculorum lipomatosa* of some German authors) in a striking array of clinical and pathological appearances. It will suffice for the present to tell you that the spinal lesion, which is never absent in infantile paralysis, in the myo-sclerotic paralysis fails absolutely, at least if I may judge from my own observations, which have been confirmed by those of Cohn-

heim. Although the superposition of fat is the rule in infantile amyotrophy of long standing, it does not necessarily take place. By the side of the muscles distended with fat, are others reduced to the smallest possible volume, in which scarcely a trace of fat is to be found. In these latter muscles you find only primitive fasciculi of very small diameter, still retaining their striations, here and there masses of sarcolemma enclosed within the sheaths. The atrophied primitive fasciculi are separated from one another by a fibrillary connective tissue evidently of new formation. The muscles which have undergone this kind of degeneration have to the eye the appearance of fibrous tissue, or of the dartos. It will be interesting to discover if the interstitial connective hyperplasia, observable in these cases, be always present; and if it date back to the first appearance of the disease, as MM. Volkmann and Steudener would lead us to believe. This point also requires to be more fully studied.

2. *Lesions of the Nervous System.—Spinal Lesions.*—The spinal lesions, to the consideration of which we now turn our attention, constitute, at the present time, both the most interesting portion of, and what is most new in, the anatomical history of infantile paralysis. I believe, therefore, it may be useful to enter upon some details. Many writers, as you well know, have described the affection in question as though it were located in the peripheral portions of the muscles or nerves. Others have wished to regard it as an essential disease, which means very little. It is but just, however, to state that the majority of physicians, who have occupied themselves particularly with the study of this disease, have, by common consent, designated the spinal cord as the location in which to find the primitive and fundamental lesions of infantile paralysis. This was a correct presumption upon their part; but, until recently, it has been supported by no really positive information. They have pleaded congestions and exudations, without being able to demonstrate their existence; for, sufficient means of investigations failing, the results of post-mortem examinations have almost always been negative or doubtful. It was under these conditions that the first regular studies, in relation to the pathological anatomy of the spinal centres in infantile paralysis, were made at la Salpêtrière. Already, in 1864, my *interne*, M. V. Cornil, and myself, had discovered (*à propos* of a fact obtained in my wards) a portion of the changes in the spinal cord which preside in the development of infantile paralysis. But it must be admitted that this was only the least important part. We had established the existence of an atrophy of the anterior columns of the gray matter, and of the white anterolateral columns in the regions of the cord whence the nerves emanate on their way to the atrophied muscles. But we had not marked the diminution in number and volume which the large motor cellules had undergone—a change which may very clearly be seen, however, in a preparation made at that time by M. Cornil, and which is now in the possession of my friend M. Duchenne (of Boulogne).

The lesion of the motor nerve-cells in infantile paralysis was first described, in 1866, by MM. Vulpian and Prévost, in the case of a woman at la Salpêtrière. In this case, which was communicated to

the Biological Society by M. Prévost, the majority of the cells, in that portion of the anterior horn corresponding to the atrophied muscles, had disappeared, and, at the points which they had occupied, the neuroglia presented the sclerotic transformation.

A fact reported by Messrs. L. Clarke and Z. Robinson, in 1869, under the name of muscular atrophy, merits to be associated with the preceding, for examination into the case enables us to recognize it as one of infantile spinal paralysis. The period of life when this disease appeared, the suddenness of the invasion of the symptoms, and the manner of the localization of the atrophy of the muscles, leave no room for doubt upon this point. Now, in this case also, the microscopic examination showed the atrophy of the anterior horns, the disappearance or granular atrophy of a certain number of motor nerve-cells, and, besides, the existence, at various points in the gray matter, of many foci of disintegration.

But, unless I am mistaken, the study, which has most contributed toward determining the true character of the spinal lesions in infantile paralysis, is that which, during the past year, my *interne*, M. Joffroy, and myself have made in the very remarkable case of a woman in my service named Wilson, who, at the age of forty-five years, succumbed to pulmonary phthisis. Paralysis developed itself suddenly in this patient when seven years old—the upper and lower extremities being alike involved. Nearly all of the muscles became rapidly atrophied; and, in addition, the extremities underwent an extreme arrest in development, and presented the characteristic deformities. In this case the lesions were very well pronounced, existing throughout nearly the entire extent of the spinal cord. They were everywhere present in greater or less degree; but, at certain points, occupied the anterior horns of the gray matter. In all parts of the cord the large motor nerve-cells were greatly changed; while in some portions, and at the points most seriously affected, entire groups of cells were wanting. Almost everywhere, in the immediate neighborhood of the cells, the neuroglia had undergone the sclerotic transformation. But there were points (and this is a fact upon which it is necessary to insist) where this lesion of the cells was the only change which the histological examination could detect, the connective tissue at these points having preserved its transparency and almost every appearance of the healthy structure.

Finally, we shall mention an atrophy with partial sclerosis of the antero-lateral columns, and a well-marked atrophy of the anterior roots most apparent in the regions of the cord most diseased—changes already alluded to in the publications preceding ours.

In the work for which our observation serves as foundation, we have felt ourselves entitled to admit that the lesion of the motor nerve-cells (which had already been mentioned by MM. Vulpian and Prévost, and by M. Clarke) is a constant fact in infantile spinal paralysis, and from it the principal symptoms of the disease arise, but particularly the paralysis and atrophy of the muscles. We also expressed the opinion that, in all probability, this is the initial anatomical lesion—the lesions of the neuroglia and the atrophy of the nerve-roots being considered as secondary phenomena.

I shall to-day be unable to develop before you all of the arguments which could be adduced in favor of these assertions; it would require too much time. And, besides, I wish to reserve this portion of my subject until I shall be able to direct your attention to the other morbid conditions belonging to the group of myopathies of spinal origin, when I propose to discuss, in order, the *rôle* which, I believe, the motor nerve-cells play in the production of the trophical lesions of the muscles. For the present, I limit myself to the following considerations, which more especially concern infantile paralysis:

In reference to our first conclusion, it is sufficient to state that its confirmation is found in all of the facts (and there are a great number of them) which have been collected since the publication of our work. For instance, the lesion of the nerve-cells is expressly alluded to by MM. Parrot and Joffroy in the case of a child in whom the disease dated back to its first year—in a case observed by M. Vulpian, at la Salpêtrière, in two cases observed by M. Damaschino, at l'Hôpital des Enfants—the particulars of which cases M. Duchenne (of Boulogne) has communicated to me. In addition, this same lesion was present in a most striking manner in three new cases quite recently collected in my service, and in which the anatomy has been studied with the greatest care by my pupils, MM. Michaud and Perrot. These new facts, in connection with those already known, constitute a sufficiently imposing array; especially when we remember that, up to this time, no case of any value has been cited in contradiction of them. All of the cases offered to our view date from a time when the methods for studying the anatomy of the cord had not attained to that degree of perfection which they to-day possess; and, besides, none of those facts has that air of precision which at present we have a right to expect in observations of this nature.

With regard to our second proposition, I bring forward the following: If, at certain points, the lesions of the neuroglia invade the greater portion of the gray matter, and at times extend even into the adjacent portions of the antero-lateral columns, it is no less true that, at other points, these lesions remain confined to the anterior horns, which they do not always occupy in their entire extent; sometimes they are seen accurately localized (and, as it were, according to rule) in very circumscribed oval spaces, corresponding to groups or collections of motor cells. How is it possible to conceive of this, if the change began in the connective tissue of the nerve-elements? Is it not much more probable that it originates in the organs specially devoted to specific functions—as the large nerve-cells called motor? Thus it is, according to the theory of M. Vulpian (a theory which I fully indorse), that the sclerosis, systematically limited to the posterior columns, are to be attributed to an irritation, occupying at first the nerve-tubes which enter into the composition of these columns. There are cases (and here the observation of Wilson may be recalled) where the alteration at certain points of a certain number—it may be of an entire group of nerve-cells—is the only lesion the histological examination can reveal; the connective tissue at the affected points having preserved its transparency, and nearly all of the characteristics of the healthy structure.

In other regions, the lesions of the neuroglia are much greater toward the central than in the peripheral portions, manifesting themselves as an exaggeration of nerve-cells; they are also much more evident in the immediate neighborhood of the cells than in the intervals which separate them; so that the cells appear like so many centres, or foci, from which the morbid process has radiated to a certain distance in every direction. Upon the other hand, we could not admit that the irritation had been originally developed in the peripheral portions, and had then extended into the central portions along the course of the anterior roots of the spinal nerves—because these latter (as MM. Parrot and Joffroy have clearly shown) usually present in recent cases comparatively slight lesions in the neighborhood of the affected portions, and in no way proportional in intensity to the lesions of the gray matter.

It seems to us evident, from the foregoing, that the motor nerve-cells are really the primary seat of the disease. Most usually, without doubt, the irritation reaches secondarily the neuroglia, and extends little by little into the different regions of the anterior horns. But this is never necessarily the case. Viewed from whatever stand-point, we must consider as consecutive and purely accessory the extension of the morbid process to the antero-lateral columns, which sometimes takes place. Judging from the character of the alterations noticed in the connective tissue, the lesion of the nerve-cells in question is of the nature of an irritation. But this is a matter on which, at present, at least, a purely anatomical examination can give us no information. In like manner (if we suppose the same thing to take place in the nerve-tubes) the irritated nerve-cells atrophy, and in the last stage of the process disappear without revealing the special character of the affections of which they are the seat.

One word, in conclusion, relative to the alterations in the connective tissue, which, in my opinion, occur secondarily, subsequent to the affection of the nerve-cells. In the old cases, they consist chiefly in a fibrillary or fibroid metamorphosis of the reticulum, with more or less complete disappearance of the nerve-tubes and condensation of tissue; but these are only the last vestiges of a morbid process long since extinct, and it is difficult to say what the primary alterations may have been. It is very probable that sometimes one could have found the characters of acute myelitis with multiplication of the myelocytes and of the masses of the vascular sheaths, such as, in a word, Frommann and Mannkopf have described. The existence of foci of disintegration, referred to in Clarke's report, and in some observations of our own recently made at la Salpêtrière, proves that in places the inflamed tissue may undergo a real dissociation. It would even seem that the cases of M. Damaschino would establish that, at the most deeply-affected points of the spinal cord, we may find all of the characteristics of destructive myelitis, with the formation of a focus of red softening. However this may be, gentlemen, you can readily perceive there is nothing in what has been said to weaken the theory that the apparatus of the motor nerve-cells is the primary focus and point of departure for the inflammatory process.

It remains for me to describe to you the symptoms caused by the lesions, and to show how the latter occasion the former—which I shall endeavor to do at an early date.

2.—*Temporary Insanity.* By Dr. PELMANT, Physician in charge of the Irrenanstalt, at Steppansfeld, Alsace. (*Der Irrenfreund*, No. 1, 1872.)

Among the manifold and dissimilar recognized conditions, which we ordinarily group together under the general designation of "Mental Derangement" (*Geistesstörungen*), one group especially has always attracted my attention. It is that one, in which the entire diseased manifestation is limited to a single attack, short in duration, and whose disappearance is as sudden as its advent has been unexpected. Hence the epithet temporary has been given to this condition; and it has been described, according to the predominating symptom, as mania, or melancholia transitoria. It is a condition in regard to the nature of which a certain degree of doubt still exists; and various views are entertained by different authors, the importance of which increases in proportion as the attack is characterized by a very sudden outburst, by great violence, etc., terrible acts of madness being very frequently committed.

In judicial medicine this condition has always been a most interesting subject; and theories most contradictory have been advanced in its explanation. The vast majority of cases of simulated insanity have always assumed this form; and speculation has been allowed wide range, since it is but seldom the courts have to decide upon an actually existing disease, but rather to give judgment upon an already past condition.

We may not hope to accomplish very much by theorizing—the question is eminently practical; and, only by studying a sufficient number of typical cases, may we presume to offer a satisfactory judgment upon such mental states. This end may possibly be served by the narration of the following history of a most interesting case:

On the evening of October 24, 1871, the foster-child of Mrs. M., while quietly seated in the chimney-corner occupied with her sewing, was suddenly stabbed in the back from behind, several wounds being inflicted in quick succession. Greatly terrified and covered with blood, she fell to the floor, when she beheld her foster-mother rushing through the open doorway, wildly brandishing a bloody dagger. Her cries for help summoned her father to the house. He instantly applied himself to stanching the flow of blood, when other cries, proceeding from the region of the attic, called him thither. There he discovered the dead body of his cook stretched upon the floor, a widely-gaping wound in the left side of the thorax, and his wife kneeling by her side, mourning and weeping, her eyes rolling wildly. In vain, he tried to calm her raving; amid tears she called loudly for her own deceased child, hours elapsing before she became tranquil, a copious epistaxis seeming to occasion relief. Presently the smell of smoke filled the house, and it was ascertained that a fire had broken out in an empty room in the attic.

What, then, had occurred in this short space of time? Who can explain the acts committed? The cook had been murdered, the child

had been dangerously wounded, the house had been set on fire, while the evident perpetrator of these deeds had so completely lost all recollection of her conduct that the narrative of them seemed to her incomprehensible and incredible. For her purpose she had used a dagger belonging to her husband. This she had concealed behind her; but, at her husband's request, handed it to him.

Upon the morning following she was taken to hospital. She was still in a state of restless melancholy, continually mourning or weeping; she would press to her bosom the photographs of her husband and child, covering them with kisses. She submitted quietly to be led about; and, later in the day, became quite composed and tranquil.

Previous history as follows: no hereditary tendency to mental disease; as a child, patient was healthy; when she was forty-two years old, she married her present husband; three years ago her only child, which she loved passionately, was born. This child died in August, 1870. In the panic following upon the battle of Wörth, she was greatly frightened, fled from her house and from the town. Shortly afterward the death of her child occurred. From that time she became sad and depressed in spirits, with decided increase of a certain nervous irritability, which at times had previously manifested itself, periodical headache, and every variety of hysterical disorder was present.

Her courses not appearing, she consulted a few days since a female physician in Strasbourg; who, after vaginal examination, assured her that she had no uterine disease, but might possibly be pregnant. For a long time her sleep has been disturbed, she complains especially of a feeling of terror, and constantly accuses her husband of attempting to hurt her during the night, etc., etc. On the morning of October 24th no particular change in her manner was observable—she was as she had been for months previous. This fearful outbreak had been the first indication of her insanity. The patient is unable to give any explanation of her conduct. She says it seemed to her that she was hearing the voice of her child calling her; beyond this all recollection fails her. Probably she, led by the supposed voice, had gone up to the vacant room in the attic (in which her child's clothing was kept), and had there erected a kind of altar, before which she offered prayer—afterward, impelled by a new hallucination, she committed the horrible deeds. One of the candles at the altar had fallen down, igniting the clothing, which was the origin of the fire in the house.

Shortly after admission to the hospital, a most typical hysterical attack developed itself. The patient was incessantly complaining of an ever-shifting pain. One day it would be the breast, another day it would be the heart, which was rapidly hastening her death. With the characteristic earnestness of such patients, she would show her carefully-preserved urine and faeces—and would be satisfied, only after most thorough physical examination, that she was mistaken in her ideas. The theatrical pathos she displayed in both speaking and acting was particularly noticeable. In addition to the extraordinary vivacity of manner natural to the inhabitants of Southern France, she showed that peculiar tendency of hysterical patients to exaltation of mind, which, however, gradually gave place to more rational conduct. Her nightly

disquietude persisted still for some time. She constantly suspected the nurse was intending to smother her; and, in consequence, refused to go to bed, begging me most pitifully to protect her. Her pulse was normal, tongue coated, digestion disturbed, and forehead usually hot. Upon the appearance of her menses she became calmer, and her deportment more natural.

Upon November 19th, her husband gave her an account of all she had done at home during the time of her mania. She received the communication with a flood of tears—could not believe it possible that he was telling the truth. During a conversation held several days later, she referred to the matter, telling me, sobbing, that she could not explain to herself why she had acted thus; and declared that all hope of happiness for her was gone. She always faints at the sight of blood, and does not allow herself even to touch a weapon. Her relatives describe her as having been always a most tender and affectionate woman. She had always esteemed the old cook, who had been for thirty years in the employ of her family. She could not recall a single point of the entire transaction. One would, naturally, not anticipate a very deep impression to have been made upon her mind, or a very thorough repentance. She believed she had acted in the manner described, but any recollection of her conduct was as foreign to her memory as was the impression of the thoughts which originally led her to the commission of the deeds of blood. In her conversations upon the subject, she spoke as though it were the affair of another person, although she never alluded to it without weeping.

On November 28th, about four weeks after the outbreak, she returned home entirely well.

3.—*Epilepsy following Injury of the Head.* By Dr. KELP, Direktor der Oldenb. Irrenanstalt, Wehnen. (*Der Irrenfreund*, No. 1, 1872.)

Until the present time, there has been no case reported of epilepsy following injury of the head. It will be seen, upon careful examination into those cases which seem to have such origin, that the cranial injuries have succeeded rather than preceded the appearance of the convulsive attacks. [This statement is so erroneous that it ought not to go uncontradicted.—EDITOR.]

In a recent treatise, "*Ueber Künstliche, Ergengung von Epilepsie bei Meerschweinchen.*" Berlin. *Klin. Wochenschrift*, No. 38, 1871, by Prof. Westphal, the writer has published an account of his experiments upon animals, in which he has occasioned epilepsy by a blow upon the head with a hammer, with the development of a well-defined epileptigonous zone which, when irritated, would excite convulsions, precisely similar to what Brown-Séquard had already seen to follow injuries of the spinal cord. Usually an interval of four to five weeks would elapse before well-marked spasms were developed.

Reasoning from these experiments, it was scarcely to be doubted that concussion of the brain in the human subject also might result in epileptic convulsions, although until the present time such result has been but seldom observed.

Westphal always found in Guinea-pigs a lesion of the medulla oblongata, or of the upper portion of the cervical region of the spinal cord—

upon cross-section of the same, very minute hæmorrhagic spots irregularly distributed throughout the gray and white substances. Very frequently the lesion extended downward, involving the entire cervical portion, and even reaching into the dorsal region. Usually there was also extravasation of blood into the cavity of the *dura spinalis*.

It is certainly remarkable that observers have so seldom seen epileptic convulsions in man, resulting from *commotio cerebri* and injuries of the spinal cord, when they so constantly follow similar injuries in animals. Westphal asserts that it is not yet proved that there exists in man an "epilepsy of spinal origin."

Although injuries of the head are very frequently the exciting cause of psychoses, they seem very rarely to produce epilepsy.

I allow myself, however, to report a case which, while belonging under this head, possesses also a medico-legal interest. R., a resident of L., accused of burglary, was brought before the jury. The evidence of the witnesses agreed perfectly in this, that since his seventh year he had been subject to epileptic convulsions, which first appeared shortly subsequent to an injury of the head, caused by a blow from the arm of a wind-mill. These attacks would recur several times daily, depriving the patient for a short time of consciousness.

I was summoned as second medical expert, and, upon careful investigation, ascertained the above testimony to be correct. During my examination the accused was seized with an epileptic convulsion; he fell to the floor, murmured unintelligibly, his hands became cold, nails blue, remaining thus until consciousness returned, when he exclaimed, "The spasm has passed off." Similar attacks would be repeated several times daily, especially when the weather was very warm, and the atmosphere sultry. In presence of the jury, he conducted himself like a person of very feeble intellect; confessed readily to the theft, which he had committed at the instigation of others; he made all manner of foolish gesticulations, so that further examination of witnesses was not deemed necessary. The judicial physician-in-chief pronounced him to be imbecile and irresponsible. With my concurrence in this opinion, he was released from custody.

About eight months afterward, upon application of the district attorney, he was again brought before the jury, accused of repeated acts of burglary. It was expressly charged that his crimes were the result of premeditation, and that he had been merely simulating epilepsy, having completely deceived the physicians by his admirably well-assumed conduct and deep cunning. A third expert—the chief judicial physician of the district in which R. resided—being called in, did not agree with us, but was of opinion that the accused was practising deception, the epileptic attacks, from which he suffered, not tending at all to render him imbecile. We, however, after renewed examination, continued to hold to our previously-expressed view of the case. In presence of the jury, he was seized with a convulsion which necessitated his leaving the court-room. When consciousness returned, he reentered the court-room, his conduct being still that of an imbecile. He was again liberated, the third expert pronouncing him to be, in his opinion, capable of judgment and responsible.

To the dismay of the magistrate and his neighbors, R. was allowed

to go home. A few weeks later the magistrate petitioned for his admission into the Irrenanstalt, in Wehnen, alleging as his chief motive therefor, the fear that he would commit fresh crimes.

Patient is twenty-three years old, large, robust, face pale, oval, forehead high, pulse feeble.

Perpendicular diameter of skull	20.0	centimetres.
Lateral	"	" 16.0 "
Long	"	" 35.0 "
Circumference	"	" 60.0 "

A cicatrix exists upon the left parietal bone, into which the index-finger may be laid; this is the result of the injury caused by the wind-mill, as related above. According to his statement, he was confined to his bed for a long time after the injury was received, cold-applications being made to the head. The spasms very soon appeared, recurring at least once in four days. There is no hereditary tendency to mental or nervous disease in his family, and the epilepsy seems to be due solely to the received injury. The patient was poor, led a vagabond life, and supported himself by rag-picking. His irregular manner of life brought him into contact with bad company, and he had been induced to commit acts of theft. When received into hospital, he was not irritable, was easily controlled, laughed frequently without cause, replied inaptly to questions, was unaware that he had committed any crime, and was able to give some correct information in regard to the circumstances of his family. He goes to work with the other patients in the field, and performs his task willingly. Since his reception, June 10, 1870, he has had convulsions only during the first few weeks, six in number, and these mild in character. Until the present time (January, 1872) no others have occurred. Since the convulsions have disappeared, the patient has constantly been manifesting a more apt and teachable disposition than was to have been expected. He has been studying arithmetic in the school, and is able to perform simple examples; he displays more interest in matters of knowledge than could reasonably be looked for; his ability to express himself increases steadily. He has improved in intelligence since the liberation of his mental powers from the effects of the convulsions; his entire expression has become better and more healthful.

I should hesitate to pronounce upon his irresponsibility, in spite of his greatly-improved condition, so fully am I persuaded that, should he be allowed to return home, and to resume his former vagabond life, the epileptic convulsions would reappear, and would exert the same injurious influence upon his mental powers as they had previously done.

In this case it is not possible to doubt that the injury of the head is alone responsible for the development of the epilepsy.

It would be most desirable to establish, by means of well-authenticated cases, the fact that epilepsy does result from injury of the head.

4.—*Psychoses, "as they are described in the Books."* By Dr. FRITZ KLOEPFEL, Physician to the Asylum, in Carlsfeld. (Der Irrenfreund, No. 1, 1872.)

Lunacy.—A. S., theological student, twenty-five years old, son of a physician in R. No hereditary predisposition to insanity. In the

gymnasium he had shown himself to be very eccentric. Upon admission to the university, he immediately applied himself with great zeal to the study of theology. The usual excesses of student-life seem to have had but little attraction for him. He soon became an ardent advocate of evangelical orthodoxy, and, in addition to carefully studying the lectures of his teachers, began to work independently, even attempting original essays. One result of these efforts was several voluminous pamphlets upon the question, "Whether Christ be God-man or Man-God!" While engaged upon this work, he remained closeted in his room, going out only to buy books to aid him in his studies. He expended so much money in the purchase of worthless volumes, that his family was obliged to remonstrate with him. Incensed at this, he began to write them urgent and at length threatening letters. Shortly afterward, he resorted to sending telegrams. He pretended he had won a large sum of money in a lottery, which, as well as his patrimony, was withheld from him by his guardian. Within the space of a few days his bills for telegrams amounted to two hundred thalers, messages having been sent by him to almost every one whom he knew. His relatives resolved to bring him home, but, anticipating their intention, he disappeared from the university, went to B., where he remained for several weeks without leaving his room, constantly working upon his manuscript. While here his illusions frequently led him to destroy articles of furniture, crockery, etc.; so that, finally, his landlord and the police began to take notice of his conduct. One day, without previous warning, he paid his bills and left the town. A short time thereafter, entirely alone, he drove up to our asylum.

His costume on arrival was very characteristic. The day was very warm—he had on fur coat and boots; a large purse filled with small coin was attached to one side of his coat, to the other a large dagger; in his hand was a thick roll of rose-tinted paper, and an enormous lead-pencil. With an air of great haste, he in writing informed the physician who received him that he was unable to speak, having latterly overworked himself. He followed this voluntary muteness by a few brief oral questions, and proceeded instantly to arrange himself comfortably in the room assigned to him. It seemed to him proper to reserve to himself his Bible—the remainder of his books he presented to a fellow-patient whom he had never previously seen. It soon became necessary to place him in solitary confinement—his hallucinations leading him to break windows, chairs, etc., and to annoy the other patients. Physical examination reveals no abnormality, save a commencing baldness; he is remarkably well nourished; bodily functions entirely normal.

He busies himself exclusively with his "theory of positive and negative natures," invented by himself. He has classified all men under these two heads. The majority are possessed of only a negative nature. He has a large collection of photographs, upon each of which he has written his diagnosis; upon a few of them it is written upon the forehead. From his own nature (which is negative), arises in his mind the idea that he is being pursued—that the freemasons and Jesuits are in search of him—that they intend to poison him, etc. He

is not at all particular in regard to his personal appearance, pretends that it is unnecessary for him to be tidy, since he is a prophet; he must soon leave the asylum, having fortunately found a suitable retreat from his pursuers. As the thoughts of his prophetic calling more firmly possess his mind, he imagines the social condition of his disciples to be improved; his insanity becomes more characteristic in his words and writings. He pretends to have received inspiration from the Holy Ghost for the work of organizing a new language from the German. He labors at this task with great zeal, bringing together in strangest union the most extravagant and dissimilar words. Every book to which he gains access is marked throughout with notes and observations. The highest aim of his life is, the self-appointed work of raising the dead; and he is constantly designating "to-morrow" as the resurrection-day. He proposes to erect a large hall, and to raise the dead by injecting a small quantity of steer's-blood into each dead body at the navel. His language often is very obscure. He speaks of "official coitus;" he is afflicted with phthisis pulmonalis—can be cured only by having his clothes placed at night in the bedroom of some female. He is extremely friendly and affectionate toward his physician, frequently asks him for musk and arsenic, which he pretends are to be his only nourishment. For a time he will refuse all food, and then propose to destroy his life by eating animal food alone. He watches every opportunity, in order to escape from the institution. He wishes to place himself in his coffin, so that he may raise himself from the dead. He is very fond of occupying himself with such (to him) philosophical questions as the following, which he propounds to his physician: "What is defecation?" "Defecation is communion with a female upon a chair." He wishes to prepare himself for his future office of "peripatetic prophet;" and, each morning brings with it a new interpretation of his prophetic duties. He asserts with great positiveness that his brain has been extracted through his nose, and he, like the crown-prince, is about to become transformed, from his head down to his genital organs, into chalk. At times he will do nothing but gaze bareheaded at the sun, or, with a field-glass, study the landscape from his window, in order thus to imbibe inspiration for his work. He has not been in the least interested in the politics of 1870. He is becoming constantly more and more untidy, must be held while his hair is being cut, because, according to his view, hair and nails are possessed of wonderful power. He insists that his urine shall be used in the preparation of medicines. Eating, drinking, and bathing, are agreeable to him only when he has some extraordinary task to perform. He calculates the rapidity of the sun's motion; plays dominoes; placing, however, a 6 against a 5, explaining this upon astrological and metaphysical grounds. He addresses his companions as "your excellency," "your majesty," etc.; at times kneeling before them, or even prostrating himself to the floor. He says that he was formerly a beaver, and in consequence wears now the fur-coat. His writings, to which he from time to time applies himself, are in harmony with such ideas. He writes letters to all the great men in Austria and Russia, filled with many philosophical and theologico-historical references extending from Rhameses the Great down

to Lavater, Schleiermacher, Frederick William IV., Schopenhauer, Tholuck, etc.

6.—*Experimental and Clinical Study of Alcoholism; Alcohol and Absinthe; Epilepsy produced by Absinthe.* By Dr. MAGNAN, Paris, 1871. Kenora & Maulde. (Psychiat. Centralblat, January 23, 1872.)

The writer first of all examines into the changes which alcohol undergoes in the animal organism, and arrives at the conclusion that alcohol, for the most part, passes out of the system as alcohol, being excreted in several ways, only a small proportion being decomposed. Next, he describes the phenomena, already known, which follow upon the inception of alcohol in large quantities. The falling off of 3.5° in the temperature of dogs moderately intoxicated is worthy of note. Duméril and Demarquay had already, in 1848, called attention to this fact, and had observed a falling in temperature of 9.6° in a dog after the administration of one hundred and twenty-five grammes of alcohol. As the result of experiments with alcohol upon animals, it was observed that, after the ordinary manifestations of intoxication had subsided, cerebral and pulmonary affections would sometimes appear, rapidly proving fatal. The writer expressly declares that, although his experiments have been very numerous, he has never seen epileptic or epileptiform convulsion follow the use of alcohol. As a rule, he subjected dogs to the prolonged action of alcohol, with the development of phenomena similar to those produced in man. From the third month of the alcohol regimen, a considerable decrease in appetite was caused, which, to a certain extent, interfered with the continuation of the experiment. Of the known group of symptoms of chronic alcoholism, the only one produced in dogs were the hallucinations: one dog ran up-stairs howling and barking, and then tumbled down two entire flights.

At the autopsies, Magnan observed a slight thickening of the cerebral membranes, but was unable to find false membrane upon the inner surface of the dura mater. The examination of the dura mater was always very careful, because pachymeningitis is very frequent in drunkards; and Kremauski (Virchow's Archiv) has found very vascular false membrane upon the dura mater in dogs which had been subjected to large doses of alcohol for several weeks together.

Magnan has made a more extensive and more interesting series of experiments with absinthe. By whatever means this substance was introduced into the economy, whether by the stomach, hypodermically, or by injection into the veins, the following phenomena were observed: If the dose were a small one, feeble, spasmodic twitchings set in, especially in the muscles of the neck, by which the head would be drawn upward and backward—a little later these twitchings would extend to the muscles of the shoulders and back. Sometimes it was observed (chiefly in dogs) that the animal would suddenly become motionless, remain standing, half unconscious, for from thirty seconds to two minutes, with head and tail lowered, and then would resume his ordinary attitude. This dizziness has some similarity to epileptic vertigo.

If the dose of absinthe be increased, the above symptoms develop

into violent attacks—the animal falls suddenly to the ground, is seized with trismus, and at times with tonic spasms of one side of the body, to which, after a few seconds, clonic spasms succeed; he froths at the mouth, and sometimes bites the tongue, breathing is rattling, urine and fæces are passed, seminal ejaculations take place. After the attack has passed off, the animal remains for some time in a state of stupor, which, however, soon yields to his ordinary condition. Only occasionally, and at intervals of from ten to twenty minutes, do the epileptic attacks recur. During the lucid intervals the animals are very often the subjects of real hallucinations, which are apparent in the manifestation of fear and horror.

When Magnan administered a mixture of alcohol and absinthe to a dog, the symptoms of inebriation appeared first, and a few hours later the above-described convulsions set in. The order in which the symptoms developed seemed to be due to the more ready absorption of the alcohol by the stomach, for this order was modified by injecting the absinthe into the veins.

The autopsies of animals poisoned by absinthe showed, besides a penetrating odor of wormwood in various organs of the body, great congestion of the cerebro-spinal vessels, and of the meninges of the brain, extreme hyperæmia of the medulla oblongata. The brain and spinal cord presented upon transverse section a uniform rosy coloring, with injection of the vessels; occasionally the stomach, more frequently the endocardium and pericardium, showed small ecchymoses.

In proof of the fact that the effect of absinthe upon animals finds its analogue among the working-men in France (who habitually drink it), Magnan cites several cases of disease, which prove that alcohol alone is not able to cause epileptic convulsions, and that these appear only in individuals who have been accustomed to the use of absinthe.

At the end of the work, Magnan discusses the prognosis and treatment of acute alcohol-poisoning. Of one thousand individuals admitted into Bicêtre (1855–1862), suffering from alcohol-poisoning, two hundred and sixty were acute cases, of which number twenty-one died; i. e., eight per cent. Of eight hundred and ninety-three inebriates (from alcohol) received into St. Anne's (1867–1869), two hundred and thirty-one were acute cases; of these only 1.30 per cent. died.

The treatment in both institutions was the same. Magnan does not think his favorable results were due to the setting aside of all bodily confinement, whereby constrained respiration and unnecessary muscular exertion upon the part of the patient, in order to escape from his hands, are spared. In cases of extraordinary frenzy, Magnan also resorts to a close-fitting but nowhere confining garment (described by him in his book), and places the patient in a well-ventilated cell, whose walls are thickly padded. A further rule of treatment is, to aid in the elimination of the alcohol from the system. This is accomplished by the administration of large quantities of water, and gentle laxatives, citrate of magnesia, bitartrate of potassa, etc. If collapse, or a condition of great weakness set in, strong beef-tea, meat, and tonics, especially quinine, must be given.

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